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HARD CHOICES

A Report on the Increasing Gap Between America's Infrastructure Needs and Our Ability To Pay for Them

Appendix 22. TEXAS

A CASE STUDY

PREPARED FOR THE USE OF THE

SUBCOMMITTEE ON ECONOMIC GOALS AND INTERGOVERNMENTAL POLICY

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

FEBRUARY 25, 1984

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Preface

Infrastructure problems are widespread. They do not respect regional or state boundaries. To secure a better data base concerning national and state infrastructure conditions and to develop threshold estimates of national and state infrastructure conditions, the Joint Economic Committee of the Congress requested that the University of Colorado's Graduate School of Public Affairs direct a twenty-three state infrastructure study. Simultaneously, the JEC appointed a National Infrastructure Advisory Committee to monitor study progress, review study findings and help develop policy recommendations to the Congress.

In almost all cases, the studies were prepared by principal analysts from a university or college within the state, following a design developed by the University of Colorado. Close collaboration was required and was received from the Governor's staff and relevant state agencies.

Because of fiscal constraints each participating university or college agreed to forego normal overhead and each researcher agreed to contribute considerable time to the analysis. Both are to be commended for their commitment to a unique and important national effort for the Congress of the United States.

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PLANNING FOR INFRASTRUCTURE NEEDS IN TEXAS
THE SCOPE OF THE PROBLEM

Prepared For

Office of the Lieutenant Governor of Texas
Texas Department of Community Affairs

In Cooperation With

The Joint Economic Committee of Congress
The University of Colorado at Denver
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August 1983

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Representing the Lieutenant Governor's Office throughout the project were Camilla Bordie and David Spurgeon. Both Ms. Bordie and Mr. Spurgeon provided valuable insights regarding the current operations and information needs of the Legislature and the executive agencies involved. The Texas Department of Community Affairs provided contract administration guidance through the able efforts of John Clary and Joe Midura. They were also immensely helpful in assisting the study group in obtaining information on the different infrastructure systems. We also wish to thank Frank Sturzl of the Texas Municipal League for his assistance throughout the project. He assisted the study team in preparation of the survey instrument, defining the sample of cities and mailing the questionnaire using the good offices of TML. Clinton Winters, a member of the staff of the Comptroller of Public Accounts, provided many useful points of information on the intricate and sometimes complicated nature of state government financing.

The project was under the overall guidance and direction of William Claggett, professor of public policy and management at the University of Texas at Dallas. He was assisted throughout the project by Sunny D. Johnston, formerly research associate in policy studies at UTD and now an economics consultant. Don Hicks, associate professor of political economy at UTD directed the basic analysis of the survey results and contributed to the team's overall grasp of infrastructure issues. Also providing assistance on various aspects of the project were Rick Collis, a graduate student at UT-Austin, who was responsible for the basic information on highway and water systems, and Pam Van Cleve and Dan Nuckols, graduate students in political economy at UTD.

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CHAPTER I

INTRODUCTION

There is growing recognition that maintenance, replacement and new construction of public infrastructure--highways, bridges, water supply and treatment facilities, solid waste disposal, and the like--is a problem that is becoming one of the most pressing public policy issues of the time. In the Summer of 1982, the University of Texas at Dallas was asked to participate in a multi-state analysis of the current needs and future outlook for the physical infrastructure of state and local governments. The Joint Economic Committee of Congress had asked the University of Colorado at Denver to coordinate a regional analysis of infrastructure needs that would assist the participating states and the Congress to better understand the dimension and complexity of the problem. In the beginning, the participating states included Texas, Colorado, New Jersey and Indiana. Since then the study has expanded considerably and now includes twenty-one states.

For purposes of the nation-wide analysis, the twenty-one case studies will be placed in a regional context to develop an understanding of aggregate national infrastructure needs and issues. The Joint Economic Committee and others looking at the national perspective will be interested in learning more about how to define national interest systems (harbors and ports, airports, interstate highways, railroads, and transmission systems), and what types of funding limitations states and localities face. In addition, the national and state-wide assessments will establish the basis for subsequent in-depth studies, thus providing the framework for such studies that may be conducted by state and local governments, universities and other research organizations in the years to come.

APPROACH AND SCOPE

Because so little is known about the full dimension of the infrastructure problem, it was established at the outset that this first overview assessment would focus on determining what is known about the extent, condition and future needs of basic infrastructure systems. Infrastructure, in general terms refers to public facilities and physical systems, and typically will include:

- Highways, roads and streets
- Bridges
- Transit systems
- Airports
- Ports and harbors
- Park land and facilities
- Sewer systems
- Water and drainage systems
- Electric and gas systems
- Solid waste disposal, and
- Public buildings.

For purposes of this overview, however, it was determined to limit the analysis to those infrastructure system generally considered to be within the classification of traditional government services. Consequently, this study focuses on:

- Highways
- Roads
- Streets
- Bridges
- Water Systems
- Sewer and Drainage Systems.

Due to time and budget limitations, it was further determined that from a national perspective all of the state studies would rely on secondary sources of information--studies, documents, plans or other analytical reports compiled by others for purposes unique to their organizational needs and interests. However, in addition to compiling information from state agencies which can be limited in scope, and because local governments have major responsibilities in the funding and provision of infrastructure, it was decided that it would be in the state interest to develop information on the local perspective of infrastructure needs. Because summary as well as detailed information concerning local government capital investment activity is lacking, and in order to compare state and local perceptions of need, it was necessary to poll local governments directly. Consequently, a state-wide survey of local infrastructure needs was developed and incorporated in the Texas case study.

Thus, with the exception of the local government survey, the Texas study is an attempt to evaluate the status of existing knowledge of infrastructure systems throughout the state. It should be viewed as a beginning step in the assessment of current and future issues of capital investment facing Texas state and local officials. In this context, the infrastructure needs assessment was intended to provide the basis for a larger, more comprehensive planning effort which the seriousness and complexity of the problem appeared to warrant. The results of this overview study have not changed that supposition.

ASSESSING EXISTING INFORMATION

Some of the most useful information to come out of the Texas case study has less to do with specific infrastructure needs throughout the state and more to do with existing institutional capabilities to identify and assess these needs.

While recognition of the issues surrounding infrastructure needs is widespread among state and local officials there is no effort currently being made to coordinate assessment procedures or establish an overall infrastructure planning process. As a result, much of the data is highly uneven in both availability and quality. There is no single organization or group of organizations with an overall sense of or responsibility for state-wide infrastructure needs.

At the state level for example, the Texas Department of Highways and Public Transportation has no mandate to collect or disseminate data or otherwise assist county and local jurisdictions with their respective needs relating to planning coordination, appreciation of uniform standards, assessment of conditions or establishing construction and maintenance priorities.

The Department of Water Resources on the other hand has recently completed an in-depth study of state-wide needs that includes all jurisdictions; however, the department does not have the responsibility or authority for permanent funding assistance. The aid now provided is limited by state constitutional authorization to issue up to $600 million in bonds, state-wide, for water development and water quality enhancement projects.

At the local level, where all of these infrastructure systems converge, there is often no capability to either plan for future needs or manage existing capital investment in any systematic way. Moreover, the lack of any entity having responsibility for planning and developing regional infrastructure systems exacerbates the management difficulties of any one local jurisdiction. The problems of overlapping infrastructure jurisdictions cannot be overstated.

As will be discussed in Chapter IV of this report, the results of the local government survey were at once lacking in information and quite informative. The collective inability among local officials to respond to questions concerning their current and future infrastructure needs--particularly among smaller cities and towns--demonstrates a local information gap every bit as large as and perhaps more significant than the revenue gap. Yet much of the brunt of infrastructure planning and provision is the responsibility of local government. Indeed, local government expenditures account for over half of total government spending on infrastructure systems in the state. The poor survey response rate together with the lack of information among those responses that were received indicates the need for assistance in information development, planning, and management of local infrastructure systems.

One of the most obvious difficulties encountered in the course of this study is the lack of comparability of data being generated at all levels of government. Within a single geographic region there are multiple jurisdictions gathering infrastructure data for their own purposes. Each government devises its own set of measures, assessment standards and projection techniques. As a result, it is very difficult to apply any overall analysis to these data or try to compare one data base with another. Such lack of comparability of information makes intergovernmental cooperation difficult, at best.

At the state level, as well, there are no standardized assumptions, or classification systems used by each agency in their planning processes that would lead to more effective interagency cooperation. Even agreeing on base year calculations or yearly inflation factors would be enormously helpful.

SUMMARY OF FINDINGS

State agencies responsible for major infrastructure systems have conducted studies of future needs based on their unique standards, assumptions and processes. Although this presents problems of comparability in the detail of projected future needs, the aggregate data provide at least order of magnitude information about liekly future capital investment needs.

With respect to future revenues, no state agency currently has responsibility for projecting where the funds will come from to pay for future needs. There is no attempt to estimate a future "revenue gap" perhaps in part because the Texas constitution prohibits deficit financing and agencies are expected to plan within the limits of available resources. The Texas Comptroller of Public Accounts is responsible for providing two-year revenue estimates based on the then current tax structure which in the aggregate establish a constitutional limit on state spending for that particular budget cycle. Therefore, in the absence of any officially recognized and accepted projection methodology beyond two years, revenue estimates to the year 2000 are subject to considerable skepticism. Nevertheless, in the context of looking at orders of magnitude regarding future needs, gross reserve projections can be extremely useful in forcing more discipline on the planning process for each infrastructure system by requiring a more rigorous setting of priorities than is now the case.

The summary of expenditure needs and revenues is shown in Table I-1 (also shown in Chapter V as Table V-11). As indicated, total expenditure needs are estimated to be about $70 billion during the period 1982-2000 for major systems for which the state has responsibility, and almost $150 billion when local government expenditures are included. Revenues are projected only for state systems due to the insufficiency of data about current expenditure patterns. Total state revenues for the period are projected to be about $60 billion resulting in an estimated unmet need of $10 billion, or an average shortfall of $600 million per year.

NEXT STEPS

The importance of all infrastructure systems to the health and vitality of the state's economy cannot be overstated. While much is known about the individual infrastructure systems, little is known about the interdependence of infrastructure systems and the necessity to plan one system in the context of the needs of another. Thus, the pace and quality of development will depend on the availability of water, sewer, road and utility systems--development cannot efficiently proceed without the timely availability of all of the systems.

In addition, we have scant information about priorities within one system and among systems, and how the priorities of one affect the priorities of all. The state's lawmakers and executives must make isolated decisions about infrastructure expenditures every biennium without understanding the affect of those decisions on the total system, let alone understanding the relationship of one system to the economic vitality of the affected region. All of this is to suggest that before the state can

TABLE I - 1

POSSIBLE UNMET REVENUE NEEDS FOR SELECTED INFRASTRUCTURE SYSTEMS OF STATE AND LOCAL GOVERNMENTS: 1982-2000

(Millions of 1982 Dollars)

	Expenditure Needs	Revenues	Unmet Needs
Highways and Bridges			
State Expenditures	$58,362	$52,732	$ 5,630
Water and Wase tewater Systems			
State Local	11,636	6,979	4,657
Other Local Government Expenditures	79,702	(1)	(1)
Total (Excluding Other Local Government)	$69,998	$59,711	$10,287

Source: See text in Chapter V for description of methods.

Note: (1) Revenue projections for other local government infrastructure expenditures could not be estimated because of insufficient data on current patterns.

effectively address a possible revenue gap in infrastructure needs, the planning and management requirements of an integrated system should be attended to. In this context, the following steps are offered for consideration. Each suggestion addresses a need identified during the course of this study.

1. Vest a single state agency or executive office with the responsibility and authority to plan and coordinate the development of infrastructure systems.

2. Develop statewide standards for planning and management of infrastructure systems, including base-line data to be used by all providers of infrastructure.

3. Undertake a statewide inventory and analysis of condition for each infrastructure system.

4. Develop a state capital budget to be included as part of the regular budget process.

5. Seek constitutional and statutory remedies for permanent capital financing of infrastructure systems.

6. Utilize regional commissions and councils of governments in an integrated approach to infrastructure planning, vesting those organizations with responsibility for reviewing and approving infrastructure plans of sub-regional units.

CHAPTER II

RESPONSIBILITIES FOR PROVISION AND MAINTENANCE OF TEXAS INFRASTRUCTURE SYSTEMS

Even the most casual examination of Texas' publicly provided infrastructure systems reveals the inherent difficulty in trying to determine precise roles and responsibilities for each level of government. Such a task becomes even more difficult when considering the contribution of the private sector in providing certain types of capital investment. In order to understand the distribution of the functional responsibilities for Texas' infrastructure, one must first consider the overlapping jurisdictions of federal, state, regional, and local governments throughout the state; and second consider the boundary spanning nature of infrastructure issues.

Texas has 254 counties, 1066 cities and towns, 24 regional councils 950 municipal utility districts, and 111 other special flooding and drainage districts. In short 2,405 different jurisdictions have some role in the planning, funding, construction and maintenance of Texas infrastructure systems. Moreover, it is a rare instance when one can find that total responsibility for a single function in the provision of public infrastructure rests solely with one authority. For example, a single function such as planning for a local wastewater facility will require the involvement of the state, the regional council, the county or counties, and local city officials. Also, state highways and county roads traverse multiple jurisdictions, frequently with one road constructed and maintained to several different standards within a short distance.

In an effort to more fully understand the intergovernmental nature of Texas' current and future capital investment needs, the following discussion will, to the extent possible, summarize governmental responsibility by infrastructure category.

TEXAS HIGHWAY SYSTEM

The Federal Role

The federal government is one of the major sources of income to the state for highway construction. While the State's allocation of the federal Highway Trust Fund varies from year to year, Federal aid apportioned to Texas for 1978 was approximately 62 percent of the total funds the State of Texas contributed to the Fund[1]. According to the highway department, in 1982 that figure climbed to 70 percent. Tables II-1 and II-2 depict the amount of federal dollars the State received from 1970-1979 and the amount of money Texas highway users contributed during the same time period.

The State Role

Texas' combined road system totals approximately 268,000 miles of highways, roads and streets. (See Table III-1.) Of that total, the state has primary responsibility for 71,212 miles of highway. The State Department of Highways & Public Transportation (SDHPT) is the agency charged with planning, constructing and maintaining the State's system. Governed by a three-member commission, SDHPT is divided into 24 autonomous districts and is the most decentralized agency in Texas State government.

TABLE II-1

STATE OF TEXAS
FEDERAL AID RECEIPTS BY THE STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
FROM THE
DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION

Amounts in $1,000 For State Fiscal Years 8/31

Purpose of Federal Aid		Percent Federal Funds	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	Ten Year Total
Primary Highways	1/ 3/	50%	26,837	30,798	33,893	21,093	11,871	2,732	918	873	1	90	129,129
Secondary Highways	2/ 3/	50%	17,131	20,086	17,674	12,703	4,153	1,486	1,012	37	-	-	74,282
Urban Highways	2/ 3/	50%	11,783	12,303	14,633	16,837	13,333	19,735	16,985	3,223	- 4,316	2,169	110,287
Interstate Highways		90%	183,023	194,247	130,633	143,836	137,289	157,364	157,136	114,097	136,437	138,380	1,492,361
Interstate Rehabilitation		75%	-	-	-	-	-	-	-	-	-	8,233	8,233
Military Access		100%	73	-	17	26	83	-	11	-	-	-	210
Emergency Relief	1/	100%	199	131	3	10	276	43	-	-	-	39	698
Forest Highways		100%	207	-	37	126	3	14	389	70	198	3	1,047
Research and Planning			3,164	4,937	4,036	740	6,081	3,176	3,187	1,423	2,333	2,036	33,300
Rural Primary	1/	50%	1,773	3,332	4,936	2,344	11,999	30,197	33,443	18,180	3,634	1,279	133,041
Rural Secondary	1/	50%	1,131	3,357	2,379	1,303	8,312	25,064	27,490	14,723	17,173	16,987	118,361
Landscape and Scenic Enhancement	1/	100%	833	286	6	1,280	383	436	16	33	-	8	3,120
TOPICS	1/	50%	-	763	3,583	8,776	8,671	7,806	3,342	841	70	60	33,839
Other	1/	50 or 75%	-	373	4,339	6,283	8,231	3,651	9,373	7,440	9,476	7,330	57,066
Urban System	1/	50%	-	-	48	376	1,870	10,913	19,103	37,363	31,492	32,932	134,179
Outdoor Advertising and Junkyard Control		75%	86	1	-	364	1,184	1,238	3,714	4,403	2,893	2,012	15,999
Railroad Crossing		90%	-	-	-	-	131	192	300	262	372	1,722	2,979
Priority Primary		70%	-	-	-	-	-	632	3,430	9,387	6,717	3,233	23,399
Safety Funds		90%	-	-	-	-	-	-	4,231	10,130	13,361	16,606	44,334
Metropolitan Planning		80%	-	-	-	-	-	-	63	2,134	2,116	1,643	5,996
Off-System Road Program		70%	-	-	-	-	-	-	330	1,760	5,786	4,613	12,382
Demonstration Program, Rail-Highway Crossings		90%	-	-	-	-	-	-	619	2,340	1,220	2,198	6,366
Transition Quarter		70%	-	-	-	-	-	-	-	22,366	36,857	18,267	77,490
Consolidated Primary		70%	-	-	-	-	-	-	-	9,123	66,220	32,031	107,373
TOTALS			228,347	273,436	236,396	213,311	216,778	264,489	306,449	343,373	313,983	310,786	2,632,198

Source: Biennial Reports of State Department of Highways and Public Transportation, Financing Federal-Aid Highways - Revisited, United States Code: Title 23 Highways

1/ Percent Federal Funds are a minimum of 70% beginning 6-1-74.

2/ Percent Federal Funds are a minimum of 90% beginning 6-1-74.

3/ Percent Federal Funds are a minimum of 75% beginning 11-6-78.

ABI. II-

STATE OF TEXAS

FEDERAL EXCISE TAXES COLLECTED FROM HIGHWAY USERS IN TEXAS

AMOUNTS IN $1,000

Calendar Years	Motor Fuels	Lube Oil	Motor Vehicle Use Tax	Automobiles and Motorcycles	Trucks Buses and Trailers	Parts and Accessories	Tires and Tubes	Tread Rubber	Totals
1960	147,661	2,954	2,568	65,910	20,036	12,213	16,797	945	269,134
1961	150,023	2,946	4,384	57,402	18,102	11,843	17,219	1,078	263,197
1962	153,060	2,980	6,917	79,123	23,464	13,698	21,833	1,491	302,566
1963	163,748	3,123	8,248	86,436	26,970	15,103	23,416	1,479	328,526
1964	174,811	3,188	8,204	96,567	30,835	16,372	24,393	1,602	356,192
1965	178,791	3,271	8,396	90,086	32,483	13,098	26,457	1,367	354,169
1966	188,312	3,476	8,611	73,182	37,139	7,690	28,046	1,372	348,028
1967	195,820	3,618	8,732	81,716	37,640	4,170	29,096	1,688	362,480
1968	206,262	3,810	9,433	91,343	40,731	5,426	31,437	1,868	390,310
1969	225,675	3,948	10,849	110,601	55,111	5,444	39,330	1,902	452,862
1970	243,933	3,812	11,428	90,460	49,336	5,636	36,786	1,899	443,300
1971	253,301	3,557	12,318	98,474	52,333	5,670	37,640	1,849	465,342
1972	274,786	3,848	13,136	1/	22,378	6,618	45,761	2,133	368,660
1973	296,919	4,242	15,842	-	43,254	7,985	53,442	1,838	422,542
1974	296,462	4,231	16,150	-	40,876	8,969	50,785	1,737	419,228
1975	301,784	4,254	16,618	-	31,810	8,313	44,146	1,664	408,589
1976	333,387	4,703	16,144	-	35,110	11,673	50,676	1,973	453,868
1977	332,707	4,944	17,907	-	37,173	13,989	58,798	1,848	507,366
1978	368,376	4,803	18,699	-	72,268	16,233	61,312	1,772	543,445
1979	338,847	4,481	22,038	-	87,717	20,234	58,697	1,684	533,898

For the most part, all of the Federal Excise Taxes collected after 3-13-66 go to the Highway Trust Fund from which appropriations are made to the various states, except that the excise taxes on automobiles and motorcycles and on parts and accessories for automobiles and motorcycles go to the General Fund. There is no relationship between the taxes going to the Trust Fund from any given State and the amounts apportioned to any given State from the Trust Fund.

Source: Federal Highway Administration

1/ The Federal Excise Tax on new automobiles was repealed effective 8-16-71.

As in other states, Texas' SDHPT obtains revenue for highways from a number of sources, relying primarily on the cents-per-gallon motor fuel taxes, motor vehicle registration fees and federal aid[2]. In 1977 the Texas Legislature enacted a formula-based funding system to meet state highway needs. The system is based on a Highway Cost Index (HCI) and uses, when necessary, transfers from State general revenues[3]. The objective of the HCI was to permit long-range planning by providing the State Highway Department with a stable financial base previously eroded by the effects of inflation, reduced federal funding and decreased gasoline consumption.

The index offers partial protection from inflation by providing a guaranteed amount of highway funding ($750 million per year) in 1979 dollars and then annually adjusting this "base amount" for inflation. As noted earlier, the foundation for funding this program is provided by revenues from state motor fuels taxes and motor vehicle registration fees. If necessary, general revenue sources are transferred to the State Highway Fund to supplement the dedicated revenue in order to attain the guaranteed funding level. The amount of general revenue to be transferred is determined by the following formula:

$$\begin{array}{l} \text{Base Amount} \\ \underline{\times\ \text{HCI}} \\ = \text{Inflation Adjusted Cost of the Program} \\ \underline{-\ \text{the Dedicated Revenue}} \\ = \text{General Revenue Transfer} \end{array}$$

The HCI is calculated by the SDHPT and is based on the actual costs of the three functional areas of highway spending: construction, maintenance, and operations[4].

According to a 1982 study conducted by the Road Information Program, Texas has 45,526 bridges. Of these, 29,654 (65 percent) are a part of the State maintained highway system and therefore under the jurisdiction of the State Highway Department. As with the state highway system, the SDHPT is responsible for the planning, construction, maintenance and operation of State bridges. Funding for these activities is again obtained through federal funds, motor fuel taxes, and vehicle registration fees.

The County Role

The role of the counties in Texas' road and bridge system is significant. In 1980, counties were responsible for 136,059 miles of roads, 947 miles of park and forest roads and 11,499 bridges. Classified under the state's rural road system, county roads comprise about 51 percent of Texas' roadway system.

According to the Texas Advisory Commission in Intergovernmental Relations, the State legislature has directed counties to perform a variety of tasks over the years, including new road construction, reconstruction, additions, improvements, retaining-wall construction, installation of traffic signals and landscaping their roads. Counties must also negotiate and purchase rights of way, and pay 10 percent of the right of way expense for State and U.S. highways. Some counties must also monitor the construction and maintenance of streets and roads in unincorporated areas so that they comply with county standards.[5]

Texas counties obtain revenue to finance their road building from a number of sources, but by far the most important source is the property tax. Table II-3 indicates that in 1978 ad valorem taxes were the source of

60.5 percent of the counties' road revenues. Motor vehicle license fees, the second largest source, accounted for 13.5 percent. An increasingly significant revenue source for Texas' county road system is borrowing, or the sale of bonds. In 1974 counties acquired approximately $25 million from bond sales for road building purposes. By 1978, that figure climbed to $69 million, or over 20 percent of total receipts compared to 12.4 percent in 1974. By far, the three largest expenditure items for county road building are maintenance, construction and engineering, and debt service[6]. In 1978 these items accounted for over 81 percent of all expenditures for road purposes (See Table II-4).

A recent inventory of the 11,499 bridges on the county road system found that 3,619 (31.5 percent) were obsolete and 5,948 (51.7 percent) were deficient. Based upon the findings of this inventory, the Federal Highway Administration (as part of the federal Bridge Replacement and Rehabilitation Program) initially allotted $9.4 million to begin work on 25 of the worst city and county bridges. For their part, the counties will have to pay for any additional right-of-way costs, but will split construction cost under an 80-20 federal-local funding formula[7].

The Role of the Cities

Approximately 59,500 miles, or 23 percent, of the Texas roadway system are found inside Texas cities, and consequently are the responsibility of the municipal governments. Another 8,900 miles of city streets coincide with state highways and are designated by the SDHPT as being "on" the state system. Such designation means that the state provides the funds for construction costs and 90 percent of the costs to purchase right-of-way. The cities pay for the curbs, storm sewers, and other "extras" which support the street/highway overlap.

Table II-3

Total Current Revenue for Road Purposes

All Texas Counties, 1974 and 1978

Source	Amount (in millions) 1974	1978	Percent of Total Revenue 1974	1978
Ad Valorem Taxes	$105.5	$166.2	51.7%	60.5%
Traffic Fines	6.6	11.1	3.2	4.0
Interest on Investments	9.3	12.5	4.6	4.6
Right-of-Way Reimbursement (State)	12.4	7.2	6.1	2.6
Motor Vehicle License Fees	34.0	37.0	16.7	13.5
Federal Aid	22.8	23.1	11.2	8.4
Lateral Road Fund	7.3	7.7	3.6	2.8
General Fund Appropriations	5.1	8.5	2.5	3.1
Other	.9	1.4	.4	.5
TOTAL	$203.9	$274.7	100.0%	100.0%

Source: Current County Road Problems in Texas. Texas Advisory Commission on Intergovernmental Relations, p. 5.

Table II-4

Total Expenditures for Road Purposes

All Texas Counties, 1974 and 1978

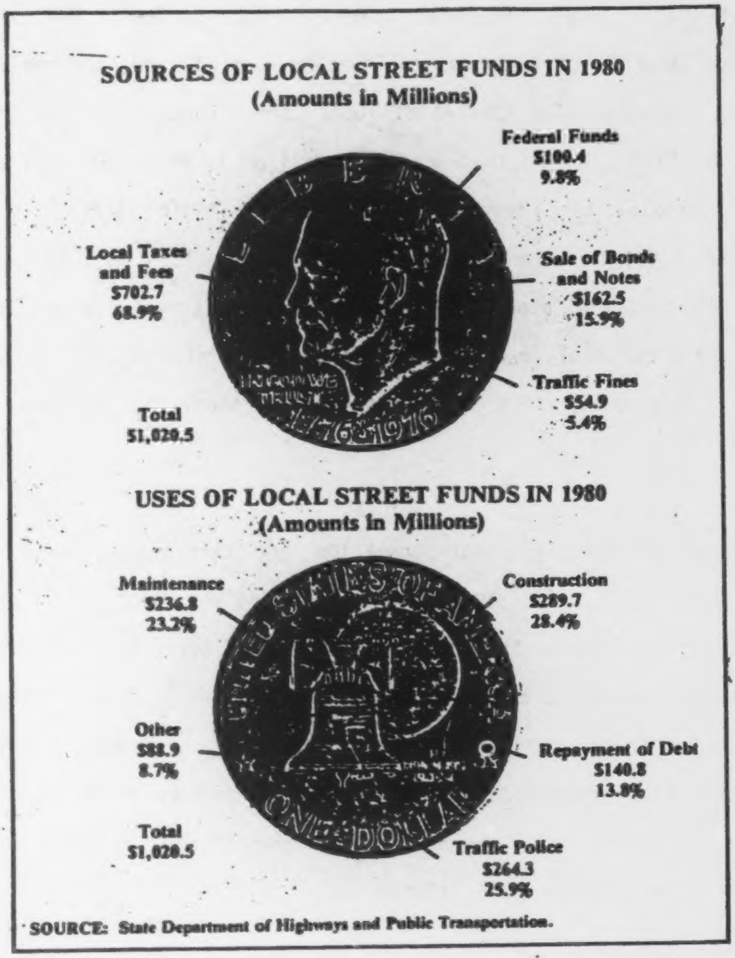
Source	Amount (in millions) 1974	Amount (in millions) 1978	Percent of Total Revenue 1974	Percent of Total Revenue 1978
Right-of-Way				
County Roads	$ 2.0	$ 2.6	0.9%	0.9%
State Highways	30.1	12.6	13.2	4.5
Construction and Engineering	43.6	65.7	19.1	23.3
Maintenance	88.4	120.7	38.8	42.8
Administration	20.6	29.7	9.0	10.5
Debt Service	36.3	43.2	15.9	15.3
Miscellaneous	7.1	7.5	3.1	2.7
TOTAL	$228.1	$282.0	100.0%	100.0%

Source: Current County Road Problems in Texas. Texas Advisory Commission on Intergovernmental Relations, p. 8.

According to the State Highway Department, the largest sources of revenue for Texas' city streets (including funds for street construction and maintenance, traffic police, parking facilities, storm sewers, sidewalks and other items) are local taxes, tolls and fees. The next greatest source is the sale of bonds, followed by Federal funds and traffic fines. Figure II-1 shows the sources of local street funding and the uses of the funds for 1980. During that year $703 million in taxes and fees was collected in Texas' cities to cover the costs of their streets (68.9 percent of the total revenues), while $162 million (15.9 percent) was generated by the sale of bonds. Federal funding contributed over $100 million toward the costs of Texas streets (9.8 percent of the total amount of revenues) in 1980 and traffic fines accounted for about $55 million, or 5.4 percent.[8]

The passage of the five-cent-per-gallon tax increase approved by Congress in late 1982 will, according to an analyst with the State Comptroller's Office, double this State's share of federal highway funds from $375 million in 1982 to $750 million in 1983. Of this, approximately half will be spent in the cities of Houston and Dallas. However, a Texas Municipal League study conducted in 1981 indicates that up to 20 percent (11,900 miles) of all municipal streets are in need of major repair--at a cost estimated to be as high as $1 billion.

FIGURE II-1



SOURCE: State Department of Highways and Public Transportation.

Source: Fiscal Notes. February 1983.

TEXAS' WATER DRAINAGE AND WASTEWATER FACILITIES

The Federal Role

Legislation enacted by the federal government oversees many water resources functions in Texas. Included among these are flood protection, dam safety, stream standards and quality of wastewater effluent discharged by users, dredge and fill in navigable waters, hydroelectric generation, endangered species, fish and wildlife protection and other environmental issues, to name a few.[9] According to the Texas Department of Water Resources (TDWR), federal agencies also provide state and local authorities assistance in the form of planning studies and construction and operation of "major" facilities such as multi-purpose water projects.

State Responsibility

As its name implies, the Texas Department of Water Resources is the lead state agency with responsibility for water resources planning and administration. TDWR by law must provide (with the aid of other state and local authorities) and maintain a comprehensive statewide water plan to meet the State's current and projected water needs. Further, TDWR administers and enforces water rights and permits, regulates and administers wastewater disposal permits, water quality protection and the collection and analysis of hydrologic data. Finally, the department provides some financial assistance to local and regional jurisdictions in the form of loans for water and wastewater projects and the purchase of storage capacity in local surface water supply projects.[10]

Local Authority

Local and regional governments, including the 1,092 public municipal water systems, 800 rural water supply corporations and 750 investor-owned public water supply systems, construct, operate and maintain water supply and wastewater facilities. According to the draft of TDWR's 1983 water plan, all such water resources projects and services must be managed and administered in accordance with relevant and applicable State and federal laws. In these efforts, local and regional authorities are responsible for securing the necessary water rights, property, and rights-of-way, and the construction and operating permits. These local and regional authorities must also arrange financing, construct and operate facilities, pay operating costs and debt service, and repay bonds and federal contracts used in project financing.

Notes

1. Texas Transportation Finance Facts, 1980, SDHPT, p. 31.
2. Fiscal Notes, Office of the Comptroller, July 1982, p. 1.
3. Ibid., p. 2.
4. Ibid., p. 3.
5. Current County Road Problems in Texas, Texas Advisory Commission on Intergovernmental Relations, January 1981, p. 1.
6. Ibid., p. 8.
7. Ibid., p. 14.
8. Fiscal Notes, State Office of the Comptroller, Feb. 1983, p. 11.
9. Water for Texas Planning for the Future, February 1983, Texas Department of Water Resources, p. I-4.
10. Ibid., p. I-3.

CHAPTER III

THE STATE PERSPECTIVE

Roads and Highways

One of the essential elements of any State's infrastructure is the road system. For Texas this is especially true given the vast geographic size of the State. The Texas road and highway system consists of 267,719 miles, more area than California, New York and Pennsylvania combined. Texans exceeded the national average of miles driven per person (6,000) by nearly 2,000 miles per person while driving over 120 billion miles in 1980.[1] Nearly 43% of all Texas towns rely solely upon trucks for freight service while nearly all agricultural produce, livestock and dairy products reach their primary markets via trucks.[2] The network of roads therefore plays a vital part in all Texans' lives.

The system itself is an administratively complex network of almost 268,000 miles. Tables III-1 and III-2 provide an estimated breakdown of the miles that each political division is responsible for maintaining. While Table III-1 illustrates the division of responsibility for respective "systems" the reality is much more complex. Many miles of the State's system cuts through the heart of metropolitan areas and counties. Thus, physical location is misleading. The simplest approach is to think in terms of "systems" for which a particular level of government is responsible, keeping in mind that physically the systems all extensively

Table III-1

Texas' Combined Road System

Jurisdiction	Number of Miles
State System	
Highways	24,311
Highways within city limits	8,663
Farm to Market	38,238
Total	71,212
County System	
Roads	136,059
Park and Forest Roads	947
Total	137,006
City/Town System	
Streets total	59,501
Statewide total	267,719

Source: Fiscal Notes Office of the Comptroller, Feb. 1983, p. 7. Texas Transportation Financial Facts 1980 State Department of Highways & Public Transportation, 1980, p. 8.

Table III-2
Bridges in Texas

Bridges	Number	Percent
On State Highway System	29,654	65.2
On County and Municipal Systems	15,872	34.8
Total	45,526	

Source: The Road Information Program, "An Assessment of Texas Bridge Deficiencies," (Washington, D.C., May 1982), p. 2.

overlap. Administrative and financial responsibility also overlap but in general it is best to think in terms of primary responsibility, therefore we speak of the State Highway system and local systems throughout this chapter. Furthermore, while financial resources are distributed in a variety of methods each level of government is principally responsible for planning and maintaining its own system.

Assessing Future Needs

The agency with primary responsibility for planning, constructing, and maintaining the State's Highway system is the State Department of Highways and Public Transportation (SDHPT). The SDHPT is governed by a three-member commission appointed to fixed terms by the Governor. As noted earlier, the Department itself is divided into 24 highly decentralized Districts. Since 1975, the SDHPT has been developing several long term plans assessing future needs of the state's highway system. The newest and most recent of these plans is the "Operational Planning Document Study" (OPDS), which was published in July, 1982. The objective of OPDS was to identify:

1) construction, rehabilitation and maintenance programs and projects
2) public transportation programs
3) operations support functions

in a prioritized sequence that will protect sunken investments and meet future needs for the next twenty years, 2002. This assessment was limited to the roads and bridges on the State System and did not include city or county systems.

The OPDS procedure was to assemble three "Working Groups" of six SDHPT personnel who were to assess needs, evaluate projects and cost estimates submitted by each of the District Offices. The process operated within two very basic constraints:

1) use of internal resources only
2) identification of statewide "needs" without regard to resource costs.

In order to assess the future estimates of need the following list provides key terms used by SDHPT that are relevant to infrastructure. As this list illustrates, the concept of maintaining the state's highway infrastructure is considerably more than the word maintenance implies. Maintenance, in fact, refers to such routine functions as litter removal, mowing medians, painting center-stripes and filling potholes and cracks. Furthermore, maintenance is one of the few infrastructure categories that is actually carried out by SDHPT personnel. The essential functions implied in the concept of maintaining infrastructure are located in the category of Construction. These functions are generally contracted out to private construction firms.

Key SDHPT Infrastructure Terms

Maintenance	Refers to routine upkeep of State's Highway System.
Construction	3 Dimensions
1) New	New construction. Initial capitalization.
2) Reconstruction	Refers to extensive replacement of current facilities in such a way as to increase capacity or structural integrity beyond original design.
3) Rehabilitation	Refers to restoring a road to its original quality.

Source: OPDS, pp. 5-9.

Table III-3 provides a categorical breakdown of the OPDS's estimate of future needs. The results of the process was a list of 5,034 projects needed by 2002 to maintain the current system and meet future demands. The State's total expenditures for the next 20 years to satisfy this list will exceed $61.1 billion. Sixty-six percent of these funds ($40.5 billion) will go to providing 11,322 miles of new traffic lanes and the reconstruction of 78,441 lane miles. A total of 499 bridges would receive reconstruction efforts. Using the largest definition of maintaining the State's system, 94.3% of the $61.1 billion would be expended.

Since no other source of future needs for the state system is available, the OPDS data form the most extensive estimates public and private officials have regarding future needs. The Road Information Program (TRIP), a research organization sponsored by highway related industries, has recently published reports assessing future needs. These data primarily focus upon bridges and bridge repair. Table III-4 represents TRIP's estimates of needs for the next 15 years.

"Structurally deficient bridges" by federal standards are defined as bridges with spans that are inadequate for existing traffic due to deterioration in their decks, supporting members or superstructures.[5] "Functionally obsolete bridges" have spans that cannot handle current traffic resulting from too narrow or too few lanes, poorly aligned approaches or restrictive overhead clearances.[6] TRIP's estimates thus include 5,163 more bridges than does the OPDS.

Assessing Local Systems

Planning for local road systems is not a function of SDHPT therefore the OPDS does not assess local needs beyond local elements of the State System. Although specific details of the local systems' needs are discussed in other sections of this report a few words about the aggregate conditions are possible. The Texas Municipal League (TML) states that in 1981 Texas cities identified $1 billion in unfunded reconstruction, repair and maintenance needs. Furthermore, TML claims that in the next 20 years

Table III-3

20-Year Highway Department Estimate of Needs

By Category

(1982 Dollars)

Function	Amount	Percent
Administration & Support	$ 1,300,394,040	2.1
Maintenance	8,512,222,153	13.9
Rehabilitation	8,574,151,046	14.0
Construction/Reconstruction	40,546,300,621	66.4
Auxiliary Operations	1,495,197,150	2.5
Public Transportation	673,904,000	1.1
Total	$61,102,169,010	100.0

Source: OPDS, p. 95.

Table III-4

TRIP Estimates of Bridge Conditions on the State Highway System

Structurally Deficient	908	
Functionally Obsolete	4,754	
	5,662	20% Total of State Bridges
Estimated 15 Year (1983-1998) Costs to Repair	$1.907	Billion
Yearly Expenditure (15 years)	$127.1	Million

the needs of the four largest cities in Texas alone ranges upwards of $34 billion.[7] The Texas Association of Counties has compiled no statistics on the aggregate needs of the State's 254 counties.

The only other aggregate data for local systems is again the TRIP bridge data. Table III-5 depicts TRIP's data. At the aggregate level then there is no statewide system for assessing future needs of local bridge systems. Analysis must therefore be provided by individual units of local government.

Financing the Future

The prospect of financing the $61.1 billion OPDS estimates is necessary over the next twenty years raises immediate questions regarding the State's funding capabilities. If the State were to meet this estimated need in the next ten biennium budget cycles it would require an average expenditure of $6.1 billion per biennium. THE SDHPT's current biennium requests, reflecting the OPDS conclusions, equals $5.6 billion, a 93 percent increase over the last biennium spending levels. A categorical breakdown of SDHPT's 1984-85 budget requests are found in Table III-6. An immediate result of the OPDS future needs assessment and the SDHPT's budget request has been to touch off a debate on the "Highway Funding Crisis." Very rapidly, then, the focus has shifted from highway needs to financing those needs.

Table III-5

TRIP Estimates of Bridge Conditions

on Local Systems

Structurally Deficient	6,940	
Functionally Obsolete	4,674	
Total	11,614	73% Total Local Bridges
Estimated 15 Year (1983-1998) Costs of Repair	$861.5 Million	
Yearly Costs (15 Years)	$ 57.4 Million	

Table III-6

Categorical Budget Requests 1984-85

	1984	1985
Administration & Support	$ 102,831,833	$ 109,021,572
Maintenance	480,214,316	514,793,222
Construction*	2,024,217,000	2,178,292,472
Auxiliary Operations	83,229,767	80,596,843
Public Transportation	73,482,955	837,012
	$2,763,975,871	$2,883,541,121

*Includes: New, Reconstruction & Rehabilitation

Source: Legislative Budget Estimates for the 1984-85 Biennium, Legislative Budget Board, January 1983.

State Financing

The State Highway Fund is the principal financial account for funding SDHPT. This fund's principal sources of revenue are:

1) State motor fund taxes
2) State motor vehicle license fees
3) General state revenues as provided by HB3 of 65th Legislature
4) Federal aid

State Motor Fuel Taxes

The State of Texas currently taxes motor fuels (gasoline and diesel) at the lowest rates in the nation. The rates of 5 cents per gallon for gasoline and 6.5 cents per gallon for diesel fuel have not been raised since 1955. However, the State Highway Fund does not receive all the revenue generated by the fuel taxes. This revenue is distributed along the following lines:

1) 25 percent to School Districts
2) 25 percent up to $7.3 million to counties, with remainder to State Farm-to-Market roads
3) 50 percent to State Highway Fund.

Although the size of this revenue fluctuates with sales figures, the most recent figures provided by SDHPT indicate 31 percent of the State Fund comes from fuel taxes.[8]

State Motor Vehicle License Fees

Revenues from vehicle license fees are collected at the county level and forwarded to the State. Each county government retains the first $50,000 of fees collected and 50 percent of the next $250,000 until the county has retained a total of $175,000. The remaining fees are remitted to the State Highway Fund. In the most recent reports on such revenue, the State collected approximately 87 percent of license fees while the county government retained approximately 13 percent.[9] These fees represent approximately 20 percent of the State's Highway Fund. License registration fee rates currently in effect were set in 1957.

General Revenue Funds

In 1977, the 65th Legislature passed HB3 which sought to provide a guaranteed funding level for the improvement of the State Highway System. The basic funding level is set at $750 million which is adjusted annually by a Highway Cost Index. The index is the weighted combined costs of highway operations, maintenance and construction adjusted for inflationary changes. The General Revenue appropriation into the Highway Fund is determined by the calculation of the difference between motor fuel taxes, sales taxes on lubricants and license fees from the basic adjust funding level.[10] In other words,

General Revenue Funds = Basic Funding Level - Motor Fuels Taxes -
Sales Taxes on Lubricants - License Fees.

The General Revenue money contributed 8.7% to the Highway Fund in the most recent SDHPT reports.[11] This represents the third largest contribution of state resources committed to the fund.

Federal Funds

The State of Texas participates in thirteen Federal Highway Trust Fund programs and two Federal General Fund programs. In these programs the Federal and State governments split funding costs in multiple functional programs. Federal shares range from 100 percent to 75 percent with the State making-up the difference. In one SDHPT account, the State has received $2.6 billion dollars in the period from 1970-1979. Fifty-eight percent of that amount is categorized as Interstate and represents reimbursements on construction projects.[12]

Local Funding

As noted earlier, the State's participation in funding local roadway needs is limited to those highway projects designated by SDHPT as being on the State's Highway System. The SDHPT Commission makes this designation. As a consequence the State pays 90 percent of the costs of right-of-way on such designated projects.[13] The cities' share covers costs of curbs, storm sewers and other extras. In 1981 such designated contracts cost cities approximately $20 million.[14] Although various federal and state programs assist in local construction efforts, only the Federal Aid Urban System (FAU) is specifically aimed at city roadways.[15] The Federal Government provides 75 percent and the State 25 percent of such funds. However, the funds are distributed on the basis of city size (5,000 population or more) rather than project need. Consequently, FAU funds in Texas in 1981 totaled $66.5 million. To date only 759 miles of metropolitan roads have been constructed using FAU funds.[16] Given the current lack of a statewide assessment of the local systems' future needs, it is difficult to assess the potential financial situation in meeting future road demands. However, this much can be said regarding the aggregate financial view for local systems. For cities and counties the primary sources for revenues are property taxes, debts, local fees and intergovernmental aid. The extent of intergovernmental aid discussed above is not particularly encouraging nor always related to need. This means that the principal burden of financing local systems falls upon property taxes, sales taxes, other revenues and debt. But in the local setting roads and streets must compete for such funds with a multitude of other programs and each locality must decide on its own which claims are most deserving. Analyzing Tables III-7 and III-8 provides a brief picture of the aggregate view. The basic problem however is that while such _ex post facto_ data is available, it is difficult or impossible to assess the relationship between these data and the reality in local systems. This difficulty is further complicated when one tries to assess the future needs. Other sections of this report will attempt to provide some understanding of this issue and the SDHPT is currently conducting a survey of some local conditions expected to be released soon. But for now, the overall needs of local systems as well as the financial capabilities of these systems remains unclear. In the words of one analyst working for the Comptroller's office:

> "One problem in assessing the needs of Texas cities for street construction and repair is the difficulty in getting data on current conditions."[16]

Table III-7

Sources of Local Street Funds in 1980

In Millions

Local Taxes & Fees	$702.7	68.9%
Bonds and Notes	$162.5	15.9%
Federal Funds	$100.4	9.8%
Traffic Fines	54.9	5.4%
Total	$1,020.5	100.0%

Source: "Financing City Streets" in Fiscal Notes. February 1983 (Austin: Office of the Comptroller).

Table III-8

Uses of Local Street Funds in 1980

In Millions

Construction	$289.7	28.4%
Traffic Police	$264.3	25.9%
Maintenance	$236.8	23.2%
Repayment of Debt	$140.8	13.8%
Other	$ 88.9	8.7%
Total	$1,020.5	100.0%

Source: Fiscal Notes. February 1983, p. 12.

Facing the State's Financial Crisis

The consequence of SDHPT's assessment of future needs and its budget requests for the current biennium has been to touch off a discussion of the Highway financing "crisis" in Texas. In the preceding section the major sources for the State Highway Fund were discussed. The following section will present some of the alternatives for resolving the crisis. It is important to keep in mind that no one is certain of the size of the financial gap that will occur over the next twenty years. One reason for this is that estimates for revenue are not available regarding long-term financing of the State Highway Fund. Most of the foundation for the debate is based upon the challenge of meeting the OPDS's projected $61.1 billion assessment and the current biennium's financial short-falls. In other words, the next 10 budgets must average $61.1 billion to meet the OPDS totals. Furthermore, the current two-year request by the SDPHT of $5.6 billion exceeds estimated Highway Funds by $1.7 billion. This deficit is in spite of an additional $800 million the recently enacted Federal gasoline-tax will provide the Highway Fund.[17] These basic facts are the sole basis for alternative financing strategies currently dominating the state. At the present time four principle financing mechanisms have been put forth:

1) increasing the amount of funding from general revenue
2) raising the motor-vehicle registration fee and motor-fuel taxes
3) levying a special tax on heavy trucks
4) bond financing of future highway expenditures.

The use of more general revenue funds would require the SDHPT to simply line-up with all other state agencies to compete for funds in an era of tight and uncertain resources. However, the history of SDHPT funding has left that agency and highway supporters in general with the feeling that they do not compete well against other programs.[18] These groups would prefer some guarantee mechanism such as exists in the Highway Trust Fund to assure stability in appropriations.

One of the most discussed options is to raise the state's motor-fuel taxes. As previously mentioned, this State's fuel taxes are currently the lowest in the nation. According to a House Study Group report the Office of the Comptroller estimates that each one-cent increase in the gasoline-tax would produce an additional $135 million over the next biennium, while a one-cent diesel increase would produce an additional $30 million.[19] Thus, a 5 cent a gallon increase would produce about $810 million more revenue during the 1984-85 biennium. However, this represents only 48 percent of the current highway deficit. The House Study Group report states that given the Federal gasoline-tax increase recently passed by Congress few state analysts consider a state hike very likely.[20] Furthermore, the Governor apparently is opposed to such a tax increase.

Currently Texas assesses no special taxes on heavy trucks. While this is a possible revenue raising approach, no analysis is available as to its revenue potential. The Legislative Budget Board has recommended a highway cost-allocation study for Texas. Beyond this not much can be said regarding this option.

A fourth option of selling bonds to finance future building was just recently added to the list of alternative financing methods. In his budget message Governor White recommended that such an approach be used. Although the details of the plan have not yet been revealed, White's message suggested that three-fourths of a cent of the current gas tax be earmarked to retire the bonds. He stated that this approach would free $700 million from general revenues for other funds. There seems to be some indication this $700 million dollars would come by replacing the current basic funding level guaranteed by HB3 of the 65th Legislature. If this is the case then White's plan would require bond sales of $700 million or more to provide the basic level now in the Fund and then $1.7 billion more to fill the current biennium's gap. This translates to $2.4 billion in bonds over the next two years alone if the budget requests are to be met. Initial reaction by State leaders has been negative though it is necessary to reiterate that more specific details of a bond approach are not currently available.

There are of course a variety of mixed approaches which could serve to provide extra revenue. At this time the likely approach to financing future state highway needs is too uncertain to allow for accurate prediction.

Water

Water is a relatively small word that encompasses as array of problems confronting the future of the State of Texas. The Texas Water Code requires the Texas Department of Water Resources (TDWR) "to formulate a comprehensive state plan" for "the orderly development and management of water resources in order that sufficient water at a reasonable cost to further the economic development of the entire state." The Code further authorizes the adoption of the plan as "a flexible guide to state policy."[21] Such a plan was established in 1968 and remains in effect today. In 1982, after the voters of Texas defeated Constitutional Amendment Proposition 4, the Clayton Plan, former Governor Bill Clements requested TDWR revise and update the State Plan.[22] This section of the chapter on the State's role in infrastructure is primarily based on the "Draft" of this revised plan published in February, 1983.

Revision Procedures

Although the TDWR took the lead in developing the plan staff assistance was received from a broad spectrum of Federal, State, Regional and Local governments as well as private citizens. Over 7,000 copies of a 40-page overview of water issues were distributed. Public forums were held in 13 cities and more than 180 interviews were conducted with key representatives of Federal, State, Regional and local governments.[23] A statewide public opinion survey of citizens' attitudes on water related issues was conducted for additional information. Following these efforts, task force committees which were formed along various functional water issues put together the findings and policy recommendations. These recommendations were voted on by the entire task force and together make up the Draft State Plan.[24] The process represented a significant effort for full participation and illustrates the State's primary function in the area of water issues - planning. The objective of this plan is to provide "a flexible guide that identifies alternative strategies for implementation in order to give direction to appropriate private and public institutions in the State to enable them to":[25]

1) supply in a cost-effective manner sufficient quantities of suitable quality of water in each area of the State...
2) continuously protect the quality of both surface and ground water ... and where practical and feasible, improve its quality;
3) provide protection of human life and public and private property from flooding and flood damage ... consistent with supply development and water quality objectives.

The plan contains extensive information on water supplies throughout the state as well as projections of future needs for each of the State's 23 river and coastal basins. It also includes data on water conservation practices and technologies, economic and demographic characteristics, water resource development, water rights, protection needs and development options within each basin. The plan contains so much data, in fact, that it defies easy condensation.

Texas has seven major aquifers, 16 minor aquifers, 15 major river basins, and 8 coastal basins which together have 3,700 streams and tributaries and more than 80,000 miles of streambeds.[26] However, as most people are aware, this supply of water is not evenly distributed throughout the State. Some areas have too much water while other have too little. Average annual rainfall for example is 56 inches along the eastern edge of the State while far West Texas averages less than eight. Furthermore, average surface runoff is 49 million acre-feet (an acre-foot of water equals 325,851 gallons) but the range of that runoff is 1,100 acre-feet per square mile in East Texas to nearly zero in far West Texas.[27]

The quantity of water used in Texas increased from about 2-million acre-feet in 1930 to about 17.9 million acre-feet in 1980.[27] Table III-9 provides a summary of water consumption throughout the state by user category in 1980.

Table III-9

Texas Water Consumption - 1980

Use	In Millions of Acre-Feet	Percentage
Irrigation	12.73	71%
Municipal	2.81	16%
Manufacturing	1.52	9%
Steam-electric power generation	.32	2%
Livestock	.24	1%
Mining	.24	1%
Total	17.86	100%

Source: House Study Group "The Price of Water, Part One: Water Planning and Development," (Austin: Texas House of Representatives), p. 11.

Of the total amount of water used in 1980, 10.85 million acre-feet or 61% came from groundwater sources. Ground water is used for municipal purposes in all areas of the State and in practically every county. In fact, TDWR reports that approximately 50% of all municipal water in the state comes from ground sources.[29] However, TDWR also reports that long-term use of such well-fields is currently lowering the water tables to the extent that water supply problems are occurring, or are projected to occur, in the near future. According to figures in a House Study Group report: "... ground water is being 'mined' -- consumed in excess of its sustainable yield -- at an average annual rate of nearly 8 million acre-feet per year."[30] The outlook for surface water supplies from major reservoirs looks equally bleak. Dependable water supply from surface reservoirs is estimated by TDWR to be 11 million acre-feet. Currently, sixty-four percent, or 7 million acre-feet, is being used. Of this percentage the three largest user functions are 53.5% for irrigation, 21.7% for municipalities and 18.2% for manufacturing.[31] The remaining 4 million acre-feet of dependable surface water is committed for use to meet the growing municipal and industrial needs of major metropolitan areas throughout the State over the next 30 years.[32] However as the Draft Plan points out, this supply of surface water is inadequate for municipal and industrial needs in those areas across the State where practically no dependable surface water supplies exist. Furthermore, the growth in the use of surface water has been about six percent a year for the last six years while the time required to plan and construct a typical reservoir is more than 15 years.[33] The clear and startling implication is that even the most immediate reservoir efforts will lag significantly behind projected use.

The Draft plan concludes that the increased demand for much of the State's future water needs will have to be met through water surface supplies. Consequently, the plan calls for greater conservation efforts as well as development of additional reservoirs. The costs of the additional reservoirs are provided in the individual basin section of the Draft Plan. However, Table III-10 illustrates that the TDWR estimates the total cost of such reservoirs between now and the year 2005 at approximately $11.6 billion. The illustration also provides estimated capital costs for other major supply and treatment areas. It is worth noting that Table III-10 amounts are calculated at an 8 percent inflation rate. Thus, all future capital costs are estimated at $40.2 billion. However, Table III-11 is an initial set of TDWR estimates using a 10 percent inflation rate and produces an estimate of $51.6 billion dollars. This represents a difference of $11.4 Billion dollars with a 2 percent decrease in the discount factor. Further evidence of these estimates sensitivity to the chosen inflation rate is shown by using constant 1980 dollars for estimate in Table III-11 and 1983 dollars for Table III-10. Such dramatic shifts not only point out the hazards of estimation but they also indicate that if the current decreasing inflation rate trend continues, estimated cost figures will drop even further.

Table III-10

Estimated Capital Requirements

1984 - 2005

(Billions)*

Reservoir Construction	$11.6
Wastewater Treatment Facilities	$20.5
Water Conveyance, Treatment Wells and Supply	$ 8.1
	$40.2

Constant 1983 Dollars = $14.9

*Figures inflated at 8% inflation rate.

Source: TDWR, Draft Plan, p. U-33.

Table III-11
Capital Cost Estimates for Non-Agriculture Water Needs in Texas through 2005
(Billions)

Major Reservoirs	$20.15	
Major Water-Conveyance Facilities	$ 7.17	
Major Raw Water-Treatment Plants	$ 1.16	
Well-field Development Projects	$ 4.17	
Subtotal Water-Supply		$32.6
Sewage Collection and Wastewater Treatment Plans	$11.5	
Flood-Protection Projects	$ 7.5	
Subtotal Treatment Projects		$19.0
10% Discount Rate		
Total Estimated Costs		$51.6
Constant 1980 Dollars		$13.2

Source: House Study Group, p. 23.

Future Needs

In each of the six user categories, the plan provides individual estimates of future needs. Each of these estimates is calculated with a "low case" and a "high case" situation in order to more adequately reflect the potential range of needs. Tables III-12 through III-17 provide summary illustration of these estimates of need.

Table III-12

Municipal and Commercial Water Use With Low and High Estimates Projected Requirements to 2030

Year	Projected Water Requirements	
	Low Case	High Case
	(Millions of acre-feet)	
1990	2.95	4.20
2000	3.51	5.08
2010	3.99	5.93
2020	4.50	6.95
2030	5.06	8.18

Source: Texas Department of Water Resources, "Water for Texas: Planning for the Future, Draft" February 1983 (Austin: TDWR), p. II-35.

Table III-13

Industrial Water Use with Low and High Projections to 2030*

Year	Projected Water Requirements	
	Low Case	High Case
	(Millions of acre-feet)	
1990	1.96	2.12
2000	2.41	2.72
2010	2.86	3.31
2020	3.47	4.08
2030	4.23	5.01

* Projections to 1990 and beyond were based upon plant utilization data which were corrected for underutilization in 1980 due to the economic recession that began in mid-1980.

Source: TDWR, Draft Water Plan, P. II-41.

Table III-14

Steam-Electric Water Use with Low and High Projections to 2030

Year	Projected Water Requirements	
	Low Case	High Case
	(Thousands of acre-feet)	
1990	330.0	535.3
2000	714.4	816.9
2010	835.4	1,017.1
2020	975.6	1,217.2
2030	1,118.6	1,417.4

Source: TDWR, Draft Water Plan, p. II-42.

Table III-15

Irrigation Water Use with Low and High Projections to 2030

Year	Projected Water Requirements	
	Low Case	High Case
	(Millions of acre-feet)	
1990	10.4	13.1
2000	10.2	17.1
2010	10.7	19.6
2020	10.8	19.9
2030	11.1	20.8

All figures include an estimate for water lost in conveyance from reservoir source to the field.

Source: TDWR, Draft State Plan, p. II-46.

Table III-16

Livestock Water Use with Low and High Projections of Requirements to 2030

Year	Projected Water Requirements*
	(Thousands of acre-feet)
1990	287.8
2000	331.7
2010	331.7
2020	331.7
2030	331.7

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* Only one set of projections was made for future livestock water requirements.

Source: TDWR, Draft State Plan, p. II-48.

Table III-17

Mining Water Use with Low and High Projections of Requirements to 2030

Year	Projected Water Requirements*
	(Thousands of acre-feet)
1990	232.6
2000	268.0
2010	308.4
2020	348.8
2030	389.4

---

[*] Only one set of projections was made for future mining water requirements. These include freshwater, saline, and brackish water.

Source: TDWR, Draft State Plan, p. II-50.

Estimates of Costs and Financing Needed

The Draft Plan provides total cost estimates for water quality protection, water wells and facilities, raw water treatment facilities, raw water conveyance facilities, reservoir and chloride control projects. In addition, the Draft provides estimates of the share of the financing from various sources. However, the Draft points out that local governments and the private sector will have to implement and operate the projects and facilities. Federal and State aid will only provide technical assistance and partial financing assistance. The principal mechanism for local financing is through borrowing. The State financial assistance is not specified in the Draft because in order to meet the shares the Plan calls for, additional legislation will be required. Hence, the size of the State's share reflects current arrangements and the Draft Plan's assessment of the "need" for State financial assistance.

Water Quality Protection

Total estimates of capital requirements for municipal wastewater collection and treatment are set forth in Table III-18. The declining Federal share for such projects reflect the Draft Plan's assessment of 1981 Amendments to Federal Legislation. The Draft estimates that by 1990 the State will be an equal partner with local sponsors in financing water quality projects of this nature. Table III-19 provides more evidence of this trend.

Table III-18

Estimates of Wastewater Collection and Treatment Facilities Costs,
with Estimates of Funding Sources (costs inflated at 8 percent).

Time of Const. a/	Cost Estimates				Source of Financing					
	Jan.'83	At Date of Construction b/			Percent			Totals		
		Hardship Cases	All Other Cases	Total	Federal	Local Sponsor	State	Federal	Local Sponsor	State
	(million dollars)									
1984-1985	721	64	777	841	22	47	58	185	396	260
1986-1987	726	68	919	987	20	51	29	200	503	284
1988-1989	726	79	1,073	1,152	17	51	32	200	588	364
1990-1991	630	93	1,073	1,166	0	50	50	0	583	583
1982-1993	630	108	1,252	1,360	0	50	50	0	680	680
1994-1995	634	126	1,470	1,596	0	50	50	0	798	798
1996-1997	637	147	1,724	1,871	0	50	50	0	935	936
1998-1999	637	171	2,011	2,182	0	50	50	0	1,091	1,091
2000-2001	655	200	2,417	2,617	0	50	50	0	1,308	1,309

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a/ Estimated State biennium in which construction should start in order to meet projected wastewater treatment requirements.

b/ Most recent costs (1983) inflated at 8.0 percent per year, to date construction is to be started.

Table III-19
Source of Funds
Obligated FY 1974 - FY 1982
Projected FY 1983 - FY 1999

	EPA Participation	Other Federal	State	Local	Total
		OBLIGATED			
FY 1973 - 1982					
Wastewater Facilities	$1,244,000,000	$195,000,000	$103,400,000	$ 828,500,000	$2,370,900,000
Ineligible Lines	-0-	-0-	-0-	879,100,000	879,100,000
Total Facilities	$1,244,000,000	$195,000,000	$103,400,000	$1,707,600,000	$3,250,000,000
	38%	6%	3%	53%	
		PROJECTIONS			
FY 1983, 1984					
Wastewater Facilities	$185,000,000	$39,000,000	$42,000,000	$117,600,000	$ 383,600,000
Ineligible Lines	-0-	-0-	-0-	175,800,000	175,800,000
Total Facilities	$185,000,000	$39,000,000	$42,000,000	$293,400,000	$ 559,400,000
	33%	7%	8%	52%	
FY 1985 - FY 1989					
Wastewater Facilities	$492,500,000	$97,500,000	$132,000,000	$ 719,000,000	$1,441,000,000
Ineligible Lines	-0-	-0-	-0-	439,500,000	439,550,000
Total Facilities	$492,500,000	$97,500,000	$132,000,000	$1,158,500,000	$1,880,550,000
	26%	5%	7%	62%	
FY 1990 - FY 1999					
Wastewater Facilities	-0-	-0-	$500,000,000	$2,015,000,000	$2,515,000,000
Ineligible Lines	-0-		-0-	879,000,000	879,000,000
Total Facilities			$500,000,000	$2,894,000,000	$3,394,000,000
			15%	85%	

Source: TDWR Draft, p. B-15.

Water Wells

Table III-20 presents cost estimates and future financial commitments for water wells by State and Local Sponsors.

Water Conveyance and Raw Water Treatment Facilities -

Estimates for such facilities are estimates at:

1980s	$1.94 billion	$296 million State Aid
1990s	$ 770 million	$115 million State Aid

Reservoir and Chloride Control Projects

1984-89	$2.14 billion	$479 million State Aid
1990-99	$2.8 billion	$953 million State Aid
2000-2005	$6.6 billion	$3.1 billion State Aid

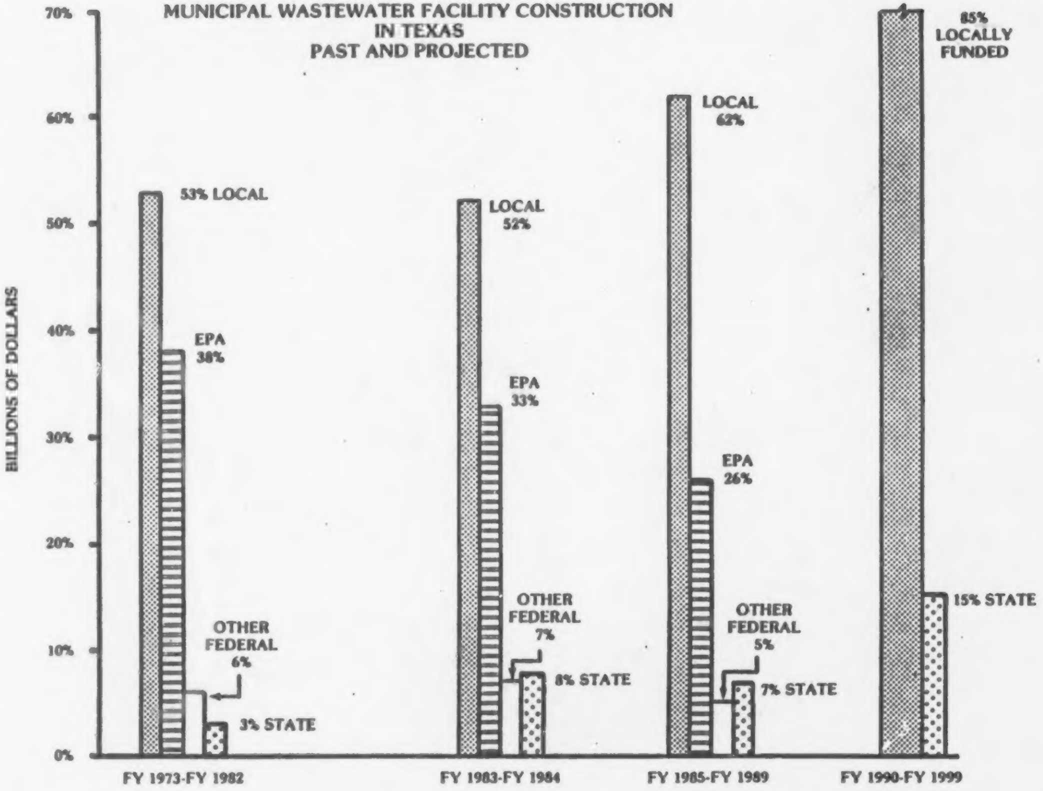
Reservoir construction is aimed at providing additional surface water. The Draft Plan anticipates that the demand for this method of supplying water will increase in the future. As mentioned earlier, reservoir projects typically require 15 years for completion. Therefore, projects started in 1984 would not be providing service until 1999 at the earliest.

The Draft Plan anticipates an increasing financial responsibility for the State in two special local-unit categories: 1. Hardship Cases and 2. Rural Water Supply Corporations. The term "Hardship Case" refers to a local sponsor that is unable to obtain financing through regular, commercial channels at reasonable rates. The Draft Plan points out that the State currently provides financial assistance to such political subdivisions. However the Draft reasons that given current high interest

Table III-20

SOURCE OF FUNDS

MUNICIPAL WASTEWATER FACILITY CONSTRUCTION IN TEXAS PAST AND PROJECTED



rates and decreasing Federal aid, the number of such hardship cases will continue to grow and predicts an even larger role for the State in such instances.

Another special case category is the Rural Water Supply Corporations. These nonprofit organizations are not government entities and thus do not currently qualify for assistance loans from the State. Again, faced with declining Federal assistance, the Draft Plan forsees the necessity for increased State efforts. However, enabling legislation for such assistance will be necessary.

As Table III-21 illustrates, future demands upon the State in the area of water will require a very large investment. But considering that most of the remaining $24.5 billion will be borne by local subdivisions the Draft Plan argues quite effectively for a larger State role.

Table III-21

Summary Estimation of Construction Costs and Estimated State Share

(Billions)

	Total	State Share
Wastewater Treatment Facilities	$20.5	$ 9.7
Reservoir	$11.6	$ 4.5
Conveyance, Water Treatment, Wells and Water Supply	$ 8.1	$ 1.5
Totals 1984-2005	$40.2	$15.7

Inflated at 8% discount rate.

Source: TDWR, Draft Plan, p. V-33.

Conclusions

The TDWR Draft Plan is the product of one of the most extensive planning efforts in Texas government. The data is extensively developed for each functional category in each of the State's 23 basins. Although the Plan may subsequently be revised by the TDWR as a result of more public and legislative hearings, it unquestionably provides the most fundamental data base on the State's role in water related infrastructure. The Draft Plan illustrates the vitality of the State in planning efforts. The trend of the Draft's analysis is clear - the State faces a major financial effort to meet future water requirements. In order to meet this challenge the State is judged to play an ever increasing financial role. The Draft's estimates are based upon this increased State role but the specification of how their money will be available for use is not part of the Draft. Hence, water, like so many other functions, will place a greater demand on State resources. It will be up to State leaders to determine the sources and the size of the commitment.

Notes

1. State Department of Highways and Public Transportation, as quoted in "Funding Texas Highways: A Decision for the Legislature," Fiscal Notes, (Austin: Office of the Comptroller, February 1983), p. 7.

2. Texas Transportation Institute, "Transportation," Texas 2000 Commission, Texas Past and Future: A Survey, (Austin: Office of the Governor, June 1981), p. 168.

3. The Road Information Program, "An Assessment of Texas Bridge Deficiencies" prepared for The Texas Good Roads and Transportation Association, (Washington, D.C. May, 1982), p. 2.

4. SDHPT, "OPDS", p. 1.

5. TRIP, p. 2.

6. Ibid., p. 3.

7. Fiscal Notes,. p. 11.

8. SDHPT, Texas Transportation Finance Facts, p. 39.

9. Ibid., p. 34.

10. Ibid., p. 36.

11. Ibid., p. 39.

12. Ibid., p. 68.

13. Fiscal Notes, February 1983, p. 11.

14. Ibid.

15. Ibid.

16. Ibid., p. 11.

17. House Study Group, "Highway Finance" February 10, 1983, p. 22.

18. Ibid., p. 23.

19. Ibid., p. 26.

20. Ibid.

21. House Study Group, "The Price of Water, Part One: Water Planning and Development," November 30, 1982, Number 86 (Austin: House of Representatives), p. 2.

22. Fiscal Notes, "Texas Water Problems: Work Begins on a New Plan," September, 1982 (Austin: Office of the Comptroller), p. 4.

23. House Study Group, p. 2.

24. Ibid.

25. Texas Department of Water Resources, "Draft, Water for Texas: Planning for the Future," February, 1983 (Austin: TDWR), p. I-4.

26. Ibid., p. I-1

27. Ibid.

28. Ibid.

29. Ibid.

30. House Study Group, p. 5.

31. Draft Plan, p. I-2.

32. Ibid.

33. Ibid.

CHAPTER IV

LOCAL INFRASTRUCTURE
NEEDS SURVEY

In November 1982, The UTD study group conducted a mail survey of municipalities throughout the State of Texas for the purpose of exploring the activities and capacities of local governments for addressing the issues relating to the planning and implementation of infrastructure construction and maintenance efforts. The survey approach was chosen since it would provide a relatively efficient and reliable empirical basis for understanding both current and future infrastructure issues in this state.

Given the great variation in the sizes of municipalities and the enormous scale of patterns of settlement in the state of Texas, many infrastructure issues which might have relatively low priority elsewhere have a special urgency for state and local officials. Certainly, the often long surface distances that separate localities make the issue of surface physical capital (e.g. highways and bridges, etc.) of particular concern.

Given the geographical location of the state and the widely varying topography and climates that Texas municipalities are exposed to, subsurface water and sewer systems likewise present special problems in a Texas context that may not necessarily emerge in a more general discussion of the nation's infrastructure circumstances. Additionally, Texas' dominant position as a magnet for national population and employment growth through the last decade and probably for the years ahead shifts a special burden onto local communities which must consider ways of providing municipal capital plant and infrastructure and derivative services. Certainly, the pressures of growth exacerbate the difficulties of responding to the changing requirements for physical capital kind and capacity in an orderly way. Often responsibilities are shifting to municipalities that are woefully unequipped to undertake the delivery of municipal services in the midst of tremendous growth and development.

Finally, though it is often lost sight of, the population and employment growth varies widely throughout Texas and the entire Southwest. Large numbers of communities continue to lose both people and jobs even in the midst of great regional and state expansion. This "churning" is not easily appreciated unless the focus of an exploration is at the local level. For this reason, then, this survey of Texas localities was conducted.

The survey used as a sampling frame the membership list of municipalities in the Texas Municipal League. As of December 1982, 30 municipalities were members of the TML; this number included 77 percent of all Texas municipalities. From that list a subset of 425 communities were selected and surveys mailed to them. (A copy of the survey is included as Appendix A). Following the initial mailing and with follow-up telephone contacts seeking to overcome obstacles to response, a total of 74 completed and useable survey questionnaires were received. This constitutes a response rate of 20 percent.

In an effort to determine the differences, if any, between the larger cities and the smaller cities' ability to respond to the survey, the responses were categorized by population. In total, 74 responses were received from the smaller cities (population under 90,000) and twelve responses came from Texas' nineteen cities with over 90,000 residents. The following discussion summarizes the responses.

SMALL CITY RESPONSE
ANALYSIS AND INTERPRETATION

Surface Infrastructure Systems

The physical capital which laces the surface of a settlement is not only materially visible but politically visible as well. While municipalities have widely divergent packages of surface infrastructure, commonly we can expect to find such things as bridges, highways, roads and streets in the inventory of each locality. Yet, even though each of these systems may service a municipality, many of them are responsibilities of other levels of government, and their provision and maintenance may be largely outside the purview of the municipality. Certainly highways (which are generally state responsibilities) and bridges (which may be the responsibility of any level of government) often reflect this mosaic of responsibilities.

Of particular concern, regardless of the infrastructure item, is the capacity of the physical plant that services a municipality to accommodate shifting patterns of use brought about by rapid growth and development in an area. The capacity of surface infrastructure to handle recent burgeoning growth is especially acute in rapidly growing metropolitan areas throughout the South and Southwest, and especially in Texas. In addition, the tendency for rapid growth in nonmetropolitan and rural areas throughout the nation likewise poses capacity-related questions for those levels of government that have sole or shared responsibility for building infrastructure anew, replacing older infrastructure with new, or upgrading existing infrastructure to handle new or expected demand.

Questions were asked in the survey about recent capital expenditures (FY 1982) for each of these items as well as estimates for projections of expenditures for these items for the budgets in FY 1987 and FY 2000. Essentially, the object was to be able to better assess the degree to which municipalities have begun to sketch out budgetary choices for the future.

The overall conclusion with regard to surface infrastructure is that in a majority of cases, municipalities were unable to report how much, if any, expenditures were made for new construction, replacement or upgrading even for projects as recently as FY 1982. Fully 56.8 percent of the municipalities responding did not report the size of their capital budgets expended for bridges in FY 1982; the figure for highways was 83.8 percent, for roads 85.1 percent and for streets 21.6 percent. While, it would be easy to suggest that this reflects a bureaucratic underdevelopment at the local level such that these expenditure figures are not easily accessible and/or recoverable, it is as likely that the responses were not provided for all the many other reasons that tend to explain low response rates in mail surveys in general.

Still, it should also be noted that in the case of the first three items, the jurisdictional responsibility generally falls to a level of government other than that of the municipality. This is all the more likely given that when asked for capital expenditures for new street construction, replacement or upgrading--wherein streets are more likely than the others to be exclusively or largely local responsibilities--the proportion of municipalities unable or unwilling to respond fell to 21.6%. See Tables IV-1 and IV-1A for overall survey response and frequency distribution.

TABLE IV-1

Actual and Projected Capital Expenditures for Maintenance and Reconstruction, In 74 Smaller Texas Municipalities, FY 1982, FY 1987 and FY 2000

			No Expenditure	Less Than $20,000	$20,000 - L.T.$100,000	$100,000 - L.T.$250,000	$250,000 L.T.$1,000,000	$1,000,000 or More	Not Reported	N	%
Infrastructure	Bridges	FY 1982	12 (16.2%)	10 (13.5%)	-	4 (5.4%)	-	1 (1.4%)	47 (63.5%)	74	(100.0)
		1987	8 (10.8)	6 (8.1)	3 (4.1)	4 (5.4)	2 (2.7)	1 (1.4)	50 (67.6)	74	(100.1)*
		2000	7 (9.5)	3 (4.1)	3 (4.1)	3 (4.1)	2 (2.7)	1 (1.4)	55 (74.3)	74	(100.2)
	Highways	1982	8 (10.8)	1 (1.4)	-	-	1 (1.4)	-	64 (86.5)	74	(100.1)
		1987	7 (9.5)	1 (1.4)	1 (1.4)	-	1 (1.4)	-	64 (86.5)	74	(100.2)
		2000	6 (8.1)	1 (1.4)	1 (1.4)	-	-	1 (1.4)	65 (87.8)	74	(100.1)
	Roads	1982	9 (12.2)	1 (1.4)	-	1 (1.4)	-	-	63 (85.1)	74	(100.1)
		1987	6 (8.1)	1 (1.4)	-	1 (1.4)	-	-	66 (89.2)	74	(100.1)
		2000	5 (6.8)	1 (1.4)	-	-	1 (1.4)	-	67 (90.5)	74	(100.1)
	Streets	1982	2 (2.7)	12 (16.2)	24 (32.4)	8 (10.8)	10 (13.5)	7 (9.5)	11 (14.9)	74	(100.0)
		1987	2 (2.7)	5 (6.8)	18 (24.3)	8 (10.8)	5 (6.8)	11 (14.9)	25 (33.8)	74	(100.1)
		2000	3 (4.1)	4 (5.4)	11 (14.9)	9 (12.2)	5 (6.8)	8 (10.8)	34 (45.9)	74	(100.1)
Infrastructure	Water Distribution Systems	1982	-	15 (20.3)	16 (21.6)	12 (16.2)	11 (14.9)	4 (5.4)	16 (21.6)	74	(100.0)
		1987	2 (2.7)	4 (5.4)	11 (14.9)	11 (14.9)	11 (14.9)	5 (6.8)	30 (40.5)	74	(100.1)
		2000	1 (1.4)	1 (1.4)	8 (10.8)	7 (9.5)	7 (9.5)	11 (14.9)	39 (52.7)	74	(100.2)
	Waste-Water Facilities	1982	1 (1.4)	21 (28.4)	13 (17.6)	10 (13.5)	4 (5.4)	2 (2.7)	23 (31.1)	74	(100.1)
		1987	3 (4.1)	9 (12.2)	17 (23.0)	4 (5.4)	6 (8.1)	4 (5.4)	31 (41.9)	74	(100.1)
		2000	1 (1.4)	2 (2.7)	10 (13.5)	8 (10.8)	4 (5.4)	7 (9.5)	42 (56.8)	74	(100.1)
	Drainage Systems	1982	8 (10.8)	16 (21.6)	5 (6.8)	3 (4.1)	3 (4.1)	2 (2.7)	37 (50.0)	74	(100.1)
		1987	6 (8.1)	12 (16.2)	5 (6.8)	2 (2.7)	3 (4.1)	3 (4.1)	43 (58.1)	74	(100.1)
		2000	5 (6.8)	9 (12.2)	3 (4.1)	2 (2.7)	3 (4.1)	4 (5.4)	48 (64.9)	74	(100.2)

*Totals may not equal 100.0% due to rounding.

TABLE IV-1a

Actual and Projected Capital Expenditures for New Construction, Replacement and/or Upgrading, In 74 Smaller Texas Municipalities, FY 1982, FY 1987 and FY 2000

			No Expenditure	Less Than $20,000	$20,000 - L.T.$100,000	$100,000 - L.T.$250,000	$250,000 - L.T.$1,000,000	$1,000,000 or More	Not Reported	N	%
Infrastructure	Bridges	FY 1982	17 (23.0%)	6 (8.1%)	1 (1.4%)	4 (5.4%)	1 (1.4%)	3 (4.1%)	42 (56.8%)	74	(100.2)*
		1987	12 (16.2)	2 (2.7)	4 (5.4)	9 (12.2)	1 (1.4)	3 (4.1)	43 (58.1)	74	(100.1)
		2000	6 (8.1)	2 (2.7)	2 (2.7)	5 (6.8)	2 (2.7)	3 (4.1)	54 (73.0)	74	(100.1)
	Highways	1982	8 (10.8)	1 (1.4)	-	1 (1.4)	1 (1.4)	1 (1.4)	62 (83.8)	74	(100.2)
		1987	7 (9.5)	-	-	1 (1.4)	1 (1.4)	1 (1.4)	64 (86.5)	74	(100.2)
		2000	6 (8.1)	-	1 (1.4)	-	-	1 (1.4)	66 (89.2)	74	(100.1)
	Roads	1982	9 (12.2)	1 (1.4)	-	1 (1.4)	-	-	63 (85.1)	74	(100.1)
		1987	7 (9.5)	1 (1.4)	-	-	1 (1.4)	-	65 (87.8)	74	(100.1)
		2000	6 (8.1)	-	1 (1.4)	-	1 (1.4)	-	66 (89.2)	74	(100.1)
	Streets	1982	13 (17.6)	5 (6.8)	15 (20.3)	7 (9.5)	7 (9.5)	11 (14.9)	16 (21.6)	74	(100.2)
		1987	9 (12.2)	3 (4.1)	10 (13.5)	1 (1.4)	10 (13.5)	14 (18.9)	27 (36.5)	74	(100.1)
		2000	9 (12.2)	3 (4.1)	6 (8.1)	4 (5.4)	4 (5.4)	11 (14.9)	37 (50.0)	74	(100.1)
Infrastructure	Water Distribution Systems	1982	4 (5.4)	4 (5.4)	12 (16.2)	13 (17.6)	11 (14.9)	10 (13.5)	20 (27.0)	74	(100.0)
		1987	6 (8.1)	1 (1.4)	5 (6.8)	7 (9.5)	10 (13.5)	15 (20.3)	30 (40.5)	74	(100.1)
		2000	3 (4.1)	-	1 (1.4)	7 (9.5)	6 (8.1)	14 (18.9)	43 (58.1)	74	(100.1)
	Waste-Water Facilities	1982	9 (12.2)	9 (12.2)	13 (17.6)	1 (1.4)	9 (12.2)	10 (13.5)	23 (31.1)	74	(100.2)
		1987	8 (10.8)	3 (4.1)	8 (10.8)	4 (5.4)	8 (10.8)	11 (14.9)	32 (43.2)	74	(100.0)
		2000	5 (6.8)	-	1 (1.4)	7 (9.5)	3 (4.1)	12 (16.2)	46 (62.2)	74	(100.2)
	Drainage Systems	1982	13 (17.6)	9 (12.2)	7 (9.5)	3 (4.1)	7 (9.5)	3 (4.1)	32 (43.2)	74	(100.2)
		1987	8 (10.8)	4 (5.4)	4 (5.4)	2 (2.7)	8 (10.8)	9 (12.2)	39 (52.7)	74	(100.2)
		2000	7 (9.5)	3 (4.1)	2 (2.7)	3 (4.1)	3 (4.1)	6 (8.1)	50 (67.6)	74	(100.2)

* Totals may not equal 100.0% due to rounding.

When capital expenditures for new surface physical infrastructure are estimated for the budgets of FY 1987 and FY 2000, the difficulty or inability to offer estimates is clearly evident. Even for streets, as we push on into the future the proportion unwilling or unable to offer a projection increases from slightly more than a third (36.5%) for FY 1987 to a half of the responding municipalities for FY 2000. Beyond this general overview, we now turn to examine the reported capital expenditure figures for the new construction, replacement or upgrading of each separate surface infrastructure item in the sections that follow.

Bridges

A question was asked concerning the number of existing bridges which are under the jurisdiction of these municipalities. Of the 74 responding municipalities, the number of bridges per municipality varied widely between less than one (i.e., shared responsibility with an adjoining municipality or another level of government) and 200 bridges. Seven of these smaller municipalities (9.5 percent) had no bridges under their jurisdiction while another thirty (40.5 percent) either were unwilling or unable to report this information. Of the one-half of the municipalities that responded that they did indeed have bridges under their jurisdictions, 2 (2.7 percent) indicated that they shared jurisdictional responsibility for a single bridge, 16 (21.6 percent) reported fewer than 5 bridges, 8 (10.8 percent) reported having 6-10 bridges, 4 (5.4 percent) reported having 11-20 bridges and 5 (6.8 percent) reported having fifty or more bridges.

The responses to the question on recent and projected capital expenditures for FY 1982, FY 1987 and FY 2000 for new bridge construction, replacement and upgrading to meet a shifting structure of demand and actual or anticipated use is reported in Table IV-2. Seventeen (23.0 percent) municipalities had spent nothing on their bridges in 1982, while the few remaining municipalities reported expenditures ranging from just over $1,000 to $3,320,000. Projections reported for the years ahead indicated that capital expenditures for new bridges were envisioned in the future by an increasing proportion of municipalities. In FY 1987 the proportion of municipalities which expected to spend nothing slipped to 16.2 percent and for FY 2000 the proportion fell to 8.1 percent. Clearly, there is at least rough evidence of the fact that municipalities envision that the capital requirements for the future will surely require expenditures on new bridges or replacement or upgrading of existing ones to handle future--and often increasing--demands. However, the difficulty of projecting to the end of the century was indicated by the fact that 43 (58.1 percent) municipalities failed to respond to the question for FY 1987 and 54 (73.0 percent) failed to respond for FY 2000. If we can take the liberty of interpolating between these selected fiscal year budget plans, it would appear that capital expenditures for bridges will either remain low throughout the next two decades or be subject to planning that is filled with uncertainty.

Table IV-2

Capital Expenditures for New Bridge Construction, Replacement and Upgrading

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	17 (23.0%)	12 (16.2%)	6 (8.1%)
2. L.T. $20,000	6 (8.1%)	2 (2.7%)	2 (2.7%)
3. $20-99,999	1 (1.4%)	4 (5.4%)	2 (2.7%)
4. $100-249,999	4 (5.4%)	9 (12.2%)	5 (6.8%)
5. $250-999,999	1 (1.4%)	1 (1.4%)	2 (2.7%)
6. $1,000,000+	3 (4.1%)	3 (4.1%)	3 (4.1%)
7. Not Reported	42 (56.8%)	43 (58.1%)	54 (73.0%)
TOTALS	74(100.2%)*	74(100.1%)*	74(100.1%)*

(*Totals exceed 100.0% due to rounding.)

A question was asked regarding recent and projected capital expenditures for the maintenance and reconstruction of existing bridges. (See Table IV-3). While a majority of municipalities did not respond to the question for any of the three budget years, a declining number of municipalities over time (16.2 percent for FY 1982, 10.8 percent for FY 1987 and 9.5 percent for FY 2000) reported that they had or would expend no funds to repair or maintain existing bridges. And for those municipalities which had or would spend money on these tasks, most never contemplated spending--or being able to spend--more than $100,000 on the projects.

A question was asked that required some indication of the revenue source that would be tapped for both new bridge construction and the maintenance of existing bridges. A fixed response format was presented which included local taxes, general obligation bonds, revenue bonds, state grants, federal grants, user fees, and other to be specified by respondent. For fifteen (20.1 percent) municipalities, local taxes was designated as the most likely revenue source for new bridge construction, replacement and upgrading; general obligation bonds were next more likely to be mentioned (10.8 percent). While a second most likely revenue source was asked for, municipalities were generally unable to indicate what it might be.

A similar question was asked regarding the revenue source for bridge maintenance and reconstruction. The most frequently mentioned revenue source was again local taxes (23.0 percent).

Table IV-3

Capital Expenditures for Briadge Maintenance and Reconstruction

EXPENDITURE LEVELS	1982	1987	200
1. No Expenditure	12 (16.2%)	8 (10.8%)	7 (9.5%)
2. L.T. $20,000	10 (13.5%)	6 (8.1%)	3 (4.1%)
3. $20-99,999	--	3 (4.1%)	3 (4.1%)
4. $100-249,999	4 (5.4%)	4 (5.4%)	3 (4.1%)
5. $250-999,999	--	2 (2.7%)	2 (2.7%)
6. $1,000,000+	1 (1.4%)	1 (1.4%)	1 (1.4%)
7. Not Reported	47 (63.5%)	50 (67.6%)	55 (74.3%)
TOTALS	74(100.0%)	74(100.1%)*	74(100.2%)*

(*Totals exceed 100.0% due to rounding.)

Highways

Twenty-six (35.1 percent) municipalities responded that they had at least some miles of highway under their jurisdiction. Another six (8.1 percent) reported that they did not, while the remaining 42 (56.8 percent) were unwilling or unable to reply. Of those municipalities that reported having jurisdictional responsibility for highways, the amount varied from one to over two hundred miles. Twenty-five (33.0 percent) reported fewer than thirty-five miles, however.

The response patterns for highways corresponded to that for bridges except that the proportion of nonresponse to the question was considerably higher--in each case in excess of 80 percent. This likely reflects the fact that highways are generally state government responsibilities even though they service municipalities. (See Tables IV-4 and IV-5.) As before, the proportion of municipalities reporting plans to expend no funds to either build new highways or repair existing highways declined across the three budget years. In FY 1982, 10.8 percent reported spending no money on highway construction while 10.8 percent also reported spending no funds on highway repair.

The revenue source most often mentioned as the first choice to fund new highway construction was state grants, though the responses are so few as to make this finding little more than logical or predictable. The same holds true for the revenue source for highway maintenance and repair.

Table IV-4

Capital Expenditures for New Highway Construction, Replacement and Upgrading

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	8 (10.8%)	7 (9.5%)	6 (8.1%)
2. L.T. $20,000	1 (1.4%)	--	--
3. $20-99,999	--	--	1 (1.4%)
4. $100-249,999	1 (1.4%)	1 (1.4%)	--
5. $250-999,999	1 (1.4%)	1 (1.4%)	--
6. $1,000,000+	1 (1.4%)	1 (1.4%)	1 (1.4%)
7. Not Reported	62 (83.8%)	64 (86.5%)	66 (89.2%)
TOTALS	74(100.2%)*	74(100.2%)*	74(100.1%)*

(*Totals exceed 100.0% due to rounding.)

Table IV-5

Capital Expenditures for State Highway Maintenance and Reconstruction

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	8 (10.8%)	7 (9.5%)	6 (8.1%)
2. L.T. $20,000	1 (1.4%)	1 (1.4%)	1 (1.4%)
3. $20-99,999	--	1 (1.4%)	1 (1.4%)
4. $100-249,999	--	--	--
5. $250-999,999	1 (1.4%)	1 (1.4%)	--
6. $1,000,000+	--	--	1 (1.4%)
7. Not Reported	64 (86.5%)	64 (86.5%)	65 (87.8%)
TOTALS	74(100.1%)*	74(100.2%)*	74(100.1%)*

(*Totals exceed 100.0% due to rounding.)

Roads

Once again the patterns of response for roads mirrors that for bridges and especially that for highways. In each case in excess of 80% of the municipalities were unwilling or unable to respond to the question. And, once again the fact that roads are often the responsibility of another level of government--county--should surely explain the sizes of these nonresponses.

Twenty-seven (36.5 percent) of the municipalities were willing and able to respond to the questions about roads. Of those responding, 14 municipalities (51.6 percent) indicated that they had no roads for which they were responsible in their jurisdictions. For the remaining municipalities which do have such responsibilities, the number of miles of roadway varies between 1.8 and 45 miles.

As was the case with highways, the proportion of municipalities which reported having recently spent nothing or planning to spend nothing on new road construction, replacement or upgrading or maintenance and reconstruction of existing highways slowly declined across the three budget years. (See Tables IV-6 and IV-7.) Given the preponderant nonresponse patterns for these questions about roads, it is not surprising to note that the questions relating to the most likely revenue source to fund new or existing roadwork yielded inconsequential response patterns.

Table IV-6

Capital Expenditures for New County Road Construction, Replacement and Upgrading

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	9 (12.28%)	7 (9.5%)	6 (8.1%)
2. L.T. $20,000	1 (1.4%)	1 (1.4%)	--
3. $20-99,999	--	--	1 (1.4%)
4. $100-249,999	1 (1.4%)	--	--
5. $250-999,999	--	1 (1.4%)	1 (1.4%)
6. $1,000,000+	--	--	--
7. Not Reported	63 (85.1%)	65 (87.8%)	66 (89.2%)
TOTALS	74(100.1%)*	74(100.1%)*	74(100.1%)*

(*Totals exceed 100.0% due to rounding.)

Table IV-7

Capital Expenditures for County Road Maintenance and Reconstruction

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	9 (12.28%)	6 (8.1%)	5 (6.8%)
2. L.T. $20,000	1 (1.4%)	1 (1.4%)	1 (1.4%)
3. $20-99,999	--	--	--
4. $100-249,999	1 (1.4%)	1 (1.4%)	--
5. $250-999,999	--	--	1 (1.4%)
6. $1,000,000+	--	--	--
7. Not Reported	63 (85.1%)	66 (89.2%)	67 (90.5%)
TOTALS	74(100.1%)*	74(100.1%)*	74(100.1%)*

(*Totals exceed 100.0% due to rounding.)

Streets

The data yield was much greater for the series of questions concerning streets ... an item of surface infrastructure that is much more commonly considered a local responsibility than either roads or highways. The vast majority of municipalities (91.9 percent) reported having responsibility for at least some street mileage. The amount varied from less than a mile to approximately 3,000 miles, though the majority (85.0 percent) reported having less than 500 miles in streets.

For the most part, the data reflect the actual and expected expenditure of funds for street construction and repair that are relatively substantial. (See Tables IV-8 and IV-9.) While in FY 1982, thirteen (17.6 percent) spent no money on new street construction, only two (2.7 percent) reported spending no funds on street repair. Eleven (14.9 percent) municipalities reported spending more than $1 million on new construction while seven (9.5 percent) spent more than $1 million on street repairs in FY 1982. Projected expenditures for new street construction are expected to exceed $100,000 for 25 (33.8 percent) municipalities in FY 1987 and 19 (25.6 percent) municipalities in FY 2000. The proportions of municipalities expecting their street repair programs to exceed $100,000 are 32.4 percent and 29.7 percent for FY 1987 and FY 2000 respectively.

Table IV-8

Capital Expenditures for New Local Street Construction, Replacement and Upgrading

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	13 (17.6%)	9 (12.2%)	9 (12.2%)
2. L.T. $20,000	5 (6.8%)	3 (4.1%)	3 (4.1%)
3. $20-99,999	15 (20.3%)	10 (13.5%)	6 (8.1%)
4. $100-249,999	7 (9.5%)	1 (1.4%)	4 (5.4%)
5. $250-999,999	7 (9.5%)	10 (13.5%)	4 (5.4%)
6. $1,000,000+	11 (14.9%)	14 (18.9%)	11 (14.9%)
7. Not Reported	16 (21.6%)	27 (36.5%)	37 (50.0%)
TOTALS	74(100.2%)*	74(100.1%)*	74(100.1%)*

(*Totals exceed 100.0% due to rounding.)

Table 9

Capital Expenditures for Local Street Maintenance and Reconstruction

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	2 (2.7%)	2 (2.7%)	3 (4.1%)
2. L.T. $20,000	12 (16.2%)	5 (6.8%)	4 (5.4%)
3. $20-99,999	24 (32.4%)	18 (24.3%)	11 (14.9%)
4. $100-249,999	8 (10.8%)	8 (10.8%)	9 (12.2%)
5. $250-999,999	10 (13.5%)	5 (6.8%)	5 (6.8%)
6. $1,000,000+	7 (9.5%)	11 (14.9%)	8 (10.8%)
7. Not Reported	11 (14.9%)	25 (33.8%)	34 (45.9%)
TOTALS	74(100.0%)	74(100.1%)*	74(100.1%)*

(*Totals exceed 100.0% due to rounding.)

Subsurface Infrastructure Systems

The size and scale of modern settlements demands infrastructure arrangements below ground every bit as complex as those above ground. Included among them are water distribution systems, wastewater facilities and drainage systems. As compared to infrastructure arrangements above ground, those below ground are much more likely to be the responsibilities of the municipalities that they serve. This is easily seen in those localities experiencing high rates of population growth and the attendant pressure of extending subsurface infrastructure systems to accommodate the increased residential, commercial and industrial development. Less easily understood is the set of circumstances facing localities that are not growing or even declining in such activity. The opportunities for contracting subsurface infrastructure arrangements and rationalizing them to accommodate reduced or redistributed residential and other economic activity needs also to be recognized by municipalities in all states and regions.

Questions were asked concerning the role of Texas municipalities in planning and funding programs that dealt with items of subsurface infrastructure. In general, the ability and/or willingness of localities to respond to these questions was greater than was the case with above-ground infrastructure systems. Yet, in all cases this willingness or ability was eroded as questions probed for expenditure projections further in the future.

Water Distribution Systems

Fifty-nine (79.7 percent) of the municipalities reported that they had jurisdiction over water distribution systems. The miles of pipe incorporated in these systems varied widely between one mile and over 14,000 miles. However, 45.9 percent reported service responsibility for fewer than 100 miles of pipe, while only 9.5 percent reported responsibility for more than 500 miles of pipe.

In FY 1982, only 5.4 percent of the municipalities reported spending no funds on new water system construction, and no municipalities failed to spend funds on repair to these systems. (See Tables IV-10 and IV-11.) Fully 32.4 percent of the municipalities spent between $100,000 and $1 million for new system components while 13.5 percent spent in excess of $1 million in FY 1982. In the same budget, 31.1 percent spent between $100,000 and $1 million in system repairs, and 5.4 percent spent in excess of $1 million.

In general, the data indicate that increasing proportions of the smaller municipalities in Texas anticipate having to spend increasing amounts for new construction and the repair and maintenance of existing water distribution systems through FY 1987 and FY 2000. Yet, increasing proportions also are either unwilling or unable to state what those amounts might be in coming years. Even so, it would appear that provision of water for municipal use is an increasingly burdensome municipal responsibility that commands attention in the planning and rough budget outlines of an increasing number of municipalities even well into the future.

Table IV-10

Capital Expenditures for New Water Districtuion System Construction, Replacement and Upgrading

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	4 (5.4%)	6 (8.1%)	3 (4.1%)
2. L.T. $20,000	4 (5.4%)	1 (1.4%)	--
3. $20-99,999	12 (16.2%)	5 (6.8%)	1 (1.4%)
4. $100-249,999	13 (17.6%)	7 (9.5%)	7 (9.5%)
5. $250-999,999	11 (14.9%)	10 (13.5%)	6 (8.1%)
6. $1,000,000+	10 (13.5%)	15 (20.3%)	14 (18.9%)
7. Not Reported	20 (27.0%)	30 (40.5%)	43 (58.1%)
TOTALS	74(100.0%)	74(100.1%)*	74(100.1%)*

(*Totals exceed 100.0% due to rounding.)

Table IV-11

Capital Expenditures for Water Distribution System Maintenance and Reconstruction

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	--	2 (2.7%)	1 (1.4%)
2. L.T. $20,000	15 (20.3%)	4 (5.4%)	1 (1.4%)
3. $20-99,999	16 (21.6%)	11 (14.9%)	8 (10.8%)
4. $100-249,999	12 (16.2%)	11 (14.9%)	7 (9.5%)
5. $250-999,999	11 (14.9%)	11 (14.9%)	7 (9.5%)
6. $1,000,000+	4 (5.4%)	5 (6.8%)	11 (14.9%)
7. Not Reported	16 (21.6%)	30 (40.5%)	39 (52.7%)
TOTALS	74(100.0%)	74(100.1%)*	74(100.2%)*

(*Totals exceed 100.0% due to rounding.)

The revenue source considered most likely to support new construction by the largest proportion of municipalities was revenue bonds (20.3 percent), with user fees (18.9%) and general obligation bonds (14.9 percent) following in order. The clear choice for second most likely revenue source was user fees (14.9 percent). For repair projects on water distribution systems, the first choice for revenue support of a majority (51.4 percent) of the smaller municipalities was user fees. Clearly the recent national trend toward the reliance by local governments on user fees to fund local services is reflected in these findings. It is especially noteworthy that in the case of water service, the shift to user fees implies that new users who often are the impetus for the underground expansion of water systems--most often at the periphery of the respective municipalities--are expected to assume the burden of the infrastructure projects their new demands make necessary.

Wastewater Facilities

The majority (72.9 percent) of the smaller municipalities in the survey reported having responsibilities for underground wastewater facilities. Only 2 (2.7 percent) reported no such responsibilities. The range of capacities of these systems varied from 140,000 to 16 million gallons a day. Thirty-eight municipalities (51.4 percent) had capacities between 1 and 50 million gallons a day.

In general, while 12.2 percent reported spending no funds on new wastewater projects during FY 1982, the proportion expecting to do so in the future is expected to decline. Much lower proportions of all municipalities report capital expenditures for maintenance and repairs at each of the three budget dates, with only one municipality reporting the expenditure of no funds for repair in FY 1982. (See Tables IV-12 and IV-13.) As was the case with water distribution systems, increasing proportions of municipalities expect to have to spend increasing amounts for both wastewater project construction and repair in coming years. Again, as we have seen above, increasing proportions of these municipalities are unable or unwilling to indicate what future budgetary commitments they expect to have to face in the coming years.

Revenue bonds were chosen as the most likely first choice to fund new wastewater facilities construction by the largest proportion (17.6 percent) of municipalities, with user fees (12.2 percent), general obligation bonds (10.8 percent) and federal grants (10.8 percent) following in order. The clear choice for the second most likely revenue source was federal grants (13.5 percent) and user fees (12.2 percent) in order. The funding of repair projects through the use of user fees was the clear choice of 48.6 percent of the municipalities.

Table IV-12

Capital Expenditures for New Wastewater Construction, Replacement and Upgrading

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	9 (12.2%)	8 (10.8%)	5 (6.8%)
2. L.T. $20,000	9 (12.2%)	3 (4.1%)	--
3. $20-99,999	13 (17.6%)	8 (10.8%)	1 (1.4%)
4. $100-249,999	1 (1.4%)	4 (5.4%)	7 (9.5%)
5. $250-999,999	9 (12.2%)	8 (10.8%)	3 (4.1%)
6. $1,000,000+	10 (13.5%)	11 (14.9%)	12 (16.2%)
7. Not Reported	23 (31.1%)	32 (43.2%)	46 (62.2%)
TOTALS	74(100.2%)*	74(100.0%)	74(100.2%)*

(*Totals exceed 100.0% due to rounding.)

Table IV-13

Capital Expenditures for Wastewater Maintenance and Reconstruction

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	1 (1.4%)	3 (4.1%)	1 (1.4%)
2. L.T. $20,000	21 (28.4%)	9 (12.2%)	2 (2.7%)
3. $20-99,999	13 (17.6%)	17 (23.0%)	10 (13.5%)
4. $100-249,999	10 (13.5%)	4 (5.4%)	8 (10.8%)
5. $250-999,999	4 (5.4%)	6 (8.1%)	4 (5.4%)
6. $1,000,000+	2 (2.7%)	4 (5.4%)	7 (9.5%)
7. Not Reported	23 (31.1%)	31 (41.9%)	42 (56.8%)
TOTALS	74(100.1%)*	74(100.1%)*	74(100.1%)*

(*Totals exceed 100.0% due to rounding.)

Drainage Systems:

Finally, drainage systems represent yet another major commitment acknowledged by a sizeable proportion (45.9 percent) of the respondent small municipalities throughout the State. Another 34 (45.9 percent) municipalities were unwilling or unable to respond to the question, while 6 (8.1 percent) answered that they had no drainage system responsibilities. Total capacities ranged from between 250,000 to 480 million gallons a day, though the majority (52.5 percent) reporting such responsibilities had capacities between 1 and 50 million gallons per day.

In FY 1982, 17.6 percent of the municipalities spent no funds for new drainage capacity, while only 10.8 percent failed to spend funds to repair existing capacity. For both new construction and repair of existing capacity, the budgetary expectations for FY 1987 and FY 2000 reveal declining proportions of municipalities expecting to be able to avoid spending at least something in coming years. Yet, as we have seen before, the degree of uncertainty surrounding those estimations increases the farther we ask municipalities to look into the future. (See Tables IV-14 and IV-15.) There is a slight tendency for increasing proportions of municipalities to anticipate having to spend increasing amounts of public funds in the future to both augment and repair drainage systems for which they are responsible.

The revenue source chosen most often as the most likely source to fund new drainage construction was local taxes (16.2 percent) with general obligation bonds coming next (9.5 percent). No clear second choice was evident. The first choice of funding for drainage system repair was local taxes (20.3 percent) with user fees (10.8 percent) and federal grants (8.1 percent) following in order.

Table IV-14

Capital Expenditures for New Drainage System Construction, Replacement and Upgrading

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	13 (17.6%)	8 (10.8%)	7 (9.5%)
2. L.T. $20,000	9 (12.2%)	4 (5.4%)	3 (4.1%)
3. $20-99,999	7 (9.5%)	4 (5.4%)	2 (2.7%)
4. $100-249,999	3 (4.1%)	2 (2.7%)	3 (4.1%)
5. $250-999,999	7 (9.5%)	8 (10.8%)	3 (4.1%)
6. $1,000,000+	3 (4.1%)	9 (12.2%)	6 (8.1%)
7. Not Reported	32 (43.2%)	39 (52.7%)	50 (67.6%)
TOTALS	74(100.2%)*	74(100.0%)	74(100.2%)*

(*Totals exceed 100.0% due to rounding.)

Table IV-15

Capital Expenditures for Drainage System Maintenance and Reconstruction

EXPENDITURE LEVELS	1982	1987	2000
1. No Expenditure	8 (10.8%)	6 (8.1%)	5 (6.8%)
2. L.T. $20,000	16 (21.6%)	12 (16.2%)	9 (12.2%)
3. $20-99,999	5 (6.8%)	5 (6.8%)	3 (4.1%)
4. $100-249,999	3 (4.1%)	2 (2.7%)	2 (2.7%)
5. $250-999,999	3 (4.1%)	3 (4.1%)	3 (4.1%)
6. $1,000,000+	2 (2.7%)	3 (4.1%)	4 (5.4%)
7. Not Reported	37 (30.0%)	43 (58.1%)	48 (64.9%)
TOTALS	74(100.1%)*	74(100.1%)*	74(100.2%)*

(*Totals exceed 100.0% due to rounding.)

PER CAPITA CAPITAL EXPENDITURES FOR INFRASTRUCTURE ACTIVITY

While the actual and reported expenditures cited above provide a useful perspective on the relative commitments of Texas' smaller municipalities to different categories of infrastructure construction, replacement, upgrading, maintenance and reconstruction, there is a need to probe more deeply. It is important not to lose sight of the fact that these expenditures constitute actual or expected commitments of limited municipal resources. In each case the level of the local commitment to infrastructure must be understood in the context of the burden on local taxpayers that these commitments entail. One first step toward more fully understanding this matter of the fiscal burden of infrastructure commitments on local taxpayers is to examine the debt environment these municipalities find themselves constrained by.

For each municipality, a per capita debt score was computed by dividing a locality's total debt--for the period September 1980-May 1981--by its 1980 population level. The resulting range of per capita debt was large--from $12.61 to $20,765. (See Table IV-16.) For only 10 (13.5 percent) of the municipalities was the per capita debt figure less than $100.00. For another 33 (44.6 percent) the level ranged between $100.00 and $500.00. A half dozen (8.1 percent) municipalities exceed $1,000.00 per capita.

Table IV-16

Per Capita Debt For Texas Municipalities

Categories of Per Capita Debt (Sept, 1980-May, 1981)	Number	Percent
None	4	(5.4%)
L.T. $100.00	10	(13.5)
$100.00-<$ 250.00	25	(33.8)
$250.00-<$ 500.00	8	(10.8)
$500.00-<$1000.00	10	(13.5)
GT.$1000.00	6	(8.1)
Not Reported	11	(14.9)
Total	74	(100.0%)

It is reasonable to assume that patterns of municipal debt are shaped at least in part by patterns of local growth or decline. Much debt obligation can be tied to either the anticipation of or the adjustment to such change patterns that define local needs. Table IV-17 illustrates variations in local debt tied to patterns of local population change between 1970-80. For ease of interpretation, municipalities were clustered into three nearly equal groupings defined by their per capita debt level. One third of the municipalities had relatively low (i.e., less than $130.00 per capita) debt levels, while a second third had a middle-range ($131.00 to less than $300.00) per capita debt levels, and a last third had relatively high (i.e., $300.00 and greater) levels.

Generally, the data indicate that per capita debt levels do not vary closely with population change patterns. While eleven (57.9 percent) of the low debt communities had experienced rapid population growth (i.e., greater than 10 percent) between 1970-80, thirteen (65.0 percent) of the high debt localities likewise experienced rapid population growth. Viewed from another perspective, nearly equal percentages of all rapidly growing localities had high and low per capita debt levels. Yet, while the numbers are small, the evidence suggests that localities losing population do not find themselves in fiscal circumstances defined by high per capita debt.

The next step is to understand just what level of a fiscal burden capital commitments to various categories of infrastructure implied during FY 1982. As we have seen above, relatively few localities either made (or expected to make in the future) fiscal commitments to either bridges, highways or roads since those categories are generally the responsibilities of county, state or national levels of government. Nonetheless, though the

Table IV-17

Per Capita Debt By Population Change (1970-80)

Per Capita Debt		Population Change 1970-80				
		Growth > 10%	Growth < 10%	Decline < 10%	Decline > 10%	
	Low Third (LT $130 per cap.)	11	4	4	-	19
	Medium Third ($131-299)	9	6	4	-	19
	High Third (GT $300 per cap.)	13	3	2	2	20
		33	13	10	2	58

data here are somewhat sparse, for those local commitments that were made, the per capita commitment for the construction, replacement and/or upgrading of physical infrastructure in 1982 varied widely. (See Table IV-18.) Actual capital expenditures for bridges varied from less than $1.00 to nearly $100.00; for highways the range was from less than $1.00 to approximately $66.00.

In general, the commitments for maintenance and reconstruction are far less. For bridges, the range was from approximately $0.01 to slightly more than $14.00 per capita. The figures for highways and roads were equally modest.

As we move on to consider categories of infrastructure that traditionally engender greater local fiscal support, we see a much different picture. The data for streets, water distribution systems, waste water facilities, and drainage systems indicate commitments of fiscal support on the part of a much larger proportion of localities. As regards construction, replacement and/or upgrading of streets, the range of per capita debt for FY 1982 was from approximately $0.34 to $300.00. For water distribution systems, the range was from approximately $0.09 to nearly $373.00 per capita; for waste water facilities the range was from just less than $0.05 to approximately $415.00; for drainage systems the range was from $0.05 to approximately $114.00.

Unlike before, the per capita commitments for the maintenance and reconstruction of these facilities were generally greater. For streets the range was from $0.53 to more than $170.00. For water distribution systems the range was from less than $0.09 to nearly $90.00; for waste water

Table IV-18

Per Capita Capital Infrastructure Committments (FY 1982)

		New Construction Replacement and/or Upgrading					Maintenance and Reconstruction				
		LT$1.00	$1.00-9.99	$10.00-49.99	$50.00-99.99	G.T. $100.00	LT$1.00	$1.00-9.99	$10.00-49.99	$50.00-99.99	G.T. $100.00
I. Surface Infrastructure	Bridges	22	6	3	1	-	21	4	1	-	-
	Highways	9	1	1	1	-	9	-	1	-	-
	Roads	9	2	-	-	-	9	2	-	-	-
	Streets	14	12	27	3	2	3	25	31	1	2
II. Subsurface Infrastructure	Water Distribution Systems	5	17	20	5	7	4	28	21	2	2
	Waste-Water Facilities	15	12	14	4	5	9	27	13	1	-
	Drainage Systems	19	12	9	1	1	22	14	1	-	-

facilities from no expenditures to nearly $59.00; and for drainage systems from no expenditures to nearly $17.00.

To help us identify patterns across per capita debt levels and infrastructure category, Tables IV-19 and IV-20 are presented. Table IV-19 displays the distribution of municipalities by their per capita commitments to seven categories of new infrastructure construction, replacement and/or upgrading; Table IV-20 does the same for infrastructure maintenance and reconstruction.

The data in Table IV-19 suggest that capital expenditures in FY 1982 for the new construction for bridges and drainage systems generally are in the lowest category of per capita burden. By contrast, streets are associated with relatively higher burdens. Both water distribution systems and wastewater facilities illustrate both relatively high and relatively low per capita burdens in different municipalities simultaneously.

The same data for maintenance and construction are reported in Table IV-20. Given all that is known about the general political and fiscal barriers to the commitment of public funds to infrastructure maintenance and repair, it is interesting to note that for all categories of infrastructure--regardless of how sparse or plentiful the data base might be--the per capita expenditures decline rapidly as we move into and across categories of increasing per capita fiscal commitments.

In general, there is clear-cut evidence of the relative under-commitment of funds in Texas smaller municipalities to maintenance and repair projects. By almost any standard, the scarcity of resources for commitment to local infrastructure projects--and particularly maintenance

Table IV-19

Per Capita Capital Expenditures for
New Construction, Replacement and/or Upgrading (FY 1982)

		L.T.$10.00	$10.00-25.00	GT.$25.00	No Expenditure	Not Reported	
I. Surface Infrastructure	Bridges	11 (14.9%)	3 (4.1)	1 (1.3)	17 (23.0)	42 (56.8)	74 (100.1%)*
	Highways	2 (2.7)	-	2 (2.7)	8 (10.8)	62 (83.8)	74 (100.0)
	Roads	2 (2.7)	-	-	9 (12.2)	63 (85.1)	74 (100.0)
	Streets	13 (17.6)	17 (23.0)	15 (20.3)	13 (17.6)	16 (21.6)	74 (100.1)
II. Subsurface Infrastructure	Water Distribution Systems	18 (24.3)	11 (14.9)	21 (28.4)	4 (5.4)	20 (27.0)	74 (100.0)
	Waste-Water Facilities	18 (24.3)	8 (10.8)	15 (20.3)	9 (12.2)	24 (32.4)	74 (100.0)
	Drainage Systems	18 (24.3)	5 (6.8)	6 (8.1)	13 (17.6)	32 (43.2)	74 (100.0)

*Totals may not equal 100.0% due to rounding

Table IV-20

		Per Capita Capital Expenditures for Maintenance and Reconstruction (FY 1982)					
		L.T.$10.00	$10.00-25.00	GT.$25.00	No Expenditure	Not Reported	
I. Surface Infrastructure	Bridges	13 (17.6%)	1 (1.3)	-	12 (16.4)	48 (64.9)	74 (100.2%)*
	Highways	1 (1.3)	1 (1.3)	-	8 (10.8)	64 (86.5)	74 (99.9)
	Roads	2 (2.7)	-	-	9 (12.2)	63 (85.1)	74 (100.0)
	Streets	26 (35.1)	21 (28.4)	13 (17.6)	2 (2.7)	12 (16.4)	74 (100.2)
II. Subsurface Infrastructure	Water Distribution Systems	32 (43.2)	14 (18.9)	11 (14.9)	-	17 (23.0)	74 (100.0)
	Waste-Water Facilities	35 (47.3)	10 (13.5)	4 (5.4)	1 (6.3)	24 (32.4)	74 (99.9)
	Drainage Systems	28 (37.8)	1 (1.3)	-	8 (10.8)	37 (50.0)	74 (99.9)

*Totals may not equal 100.0% due to rounding and repair projects--is determined less by burdensome per capita municipal debt circumstances and more by local political decisions not to tax at a level that would allow greater fiscal commitment to the problems of local infrastructure construction and maintenance.

Additional Infrastructure Needs

The municipalities surveyed were asked to rank order the categories of infrastructure which we have discussed to this point. The two categories which tied for top priority were local streets and wastewater facilities (33.8 percent) with water distribution systems (28.4 percent) following closely. Water systems (28.4 percent), streets (25.7 percent) and wastewater facilities (18.9 percent) were the choices for the infrastructure system with the second highest priority. The lowest priority categories were wastewater systems which received the largest number of choices for least important system (9.5 percent) followed by roads (8.1 percent) and highways and drainage systems tied at 6.8 percent.

When local governments were asked whether they faced additional extraordinary infrastructure needs involving such things as airport, harbor or port construction or the provision of public buildings, parks or solid waste disposal facilities, all but one municipality responded. For 50 (67.6 percent) of them the answer was in the affirmative (See actual questionnaires for sample needs.) Twenty-one (28.4 percent) responded that they did not face extraordinary circumstance.

LARGE CITY SURVEY

ANALYSIS AND INTERPRETATION

Twelve of Texas' nineteen largest cities responded to the survey. They range in population from 90,027 to 785,410. The following is a list of these twelve cities, their 1970 population, 1980 population, the percentage change, and 1980 population rank.

RANK	CITY	1970	1980	% change
3	San Antonio	654,153	785,410	20.1
5	Ft. Worth	393,455	385,141	-2.1
6	Austin	253,259	345,496	36.3
7	Corpus Christi	204,525	231,999	13.4
8	Lubbock	149,101	173,979	16.7
9	Arlington	90,229	160,123	77.5
10	Amarillo	127,010	149,230	17.5
11	Garland	81,437	138,857	70.5
12	Beaumont	117,548	118,102	0.5
14	Irving	97,260	109,943	13.0
15	Waco	95,326	101.261	6.2
16	Abilene	89,653	98,315	9.7

As can be seen, most of the larger Texas cities had substantial population growth with Arlington and Garland having better than a 70% growth rate between 1970 and 1980.

Surface Infrastructure Systems

As with the smaller cities' responses, a significant number of the larger citie did not report how much money was spent for new construction, replacement, or upgrading even for projects as recently as FY 1982. The proportion of the capital budgets expended for bridges in FY 1982 was unknown, or not reported, in 41.6 percent of the cases; the figures for highways was 75 percent, for roads 83.3 percent and for streets 8.3 percent.

The difficulty in obtaining data for FY 1982, and FY 1987 and FY 2000, can again be explained by possible bureaucratic underdevelopment at the local level such that the monetary data is not readily accessible and/or recoverable. More likely however, it may be a simple case of identifying jurisdictional responsibility, e.g., streets are generally a local responsibility.

When asked about capital expenditures for new surface infrastructure in FY 1987 and FY 2000, the data in the surveys becomes increasingly sparse. The amount of the capital budget expended for bridges in FY 1987 was unknown, or unreported, in 50 percent of the cases; the figures for highways was 75 percent, for roads 91 percent and for streets 16 percent. Pertaining to FY 2000, data was lacking for bridges in 66.6 percent of the cases, for highways 91 percent, for roads 91 percent, and streets 50 percent.

When looking at capital expenditures for maintenance and reconstruction in FY 1982, FY 1987, FY 2000, the figures were less frequently reported. Except for the streets category, 50 percent to 91 percent of the municipalities reported no intended budgetary outlays for surface infrastructure.

Bridges

With eleven out of the twelve cities offering some response, the total number of bridges was 771.

When asked about recent and projected capital expenditures for FY 1982, FY 1987, and FY 2000 for new bridge construction, replacement, and upgrading seven municipalities (58.3 percent) reported spending either nothing on their bridges, or did not respond to the question. The other five cities' responses ranged from $100,000 to $3,320,000. The total spent for bridges in FY 1982 equaled $4,130,000 while the mean was $344,000 for these five municipalities. As the survey asked for projections for the years 1987 and 2000 the percentage not reporting increased to 50 percent and 66 percent respectively.

Looking at capital expenditures for maintenance and reconstruction of bridges, a range of $3,000 to $1,000,000 appears for FY 1982. With only four cities responding. As with expenditures on new construction, the response rate concerning expenditures on maintenance and reconstructions of bridges shows that municipalities in general (3 out of 4 reporting) plan to spend less than $500,000 in FY 1982. Additionally, two more cities said that they planned expenditures for maintenance in 1987. Again most plan to spend less than $500,000 on bridges (5 out of 6). FY 2000 shows nine cities not reporting while two cities reported expenditures in the $500,000 to $1,00,000 range.

Responses to the question that asked for the revenue source that would be tapped for both new bridge construction and the maintenance of existing bridges were predictable. Of the twelve cities reporting, seven identified their revenue source for bridges. Four of these stated their major revenue source was general obligation bonds; one stated federal grants; one said local taxes and revenue sharing; one said state and federal grants. By far the most frequently identified revenue source maintenance and reconstruction was local taxes.

Highways

The cities of Irving and San Antonio were the only large cities who responded to the questions of highways in their jurisdiction. Again, a reasonable explanation would be that highways are state government responsibilities even though often they service the larger municipalities.

Both Irving and San Antonio spent 10 million or more in FY 1982 for new construction (San Antonio = 64,600,000; Irving = 10,000,000). The per capita expenditure for both cities was greater than $25.00 for FY 1982. For FY 1987 only San Antonio and Austin reported figures. When asked about FY 2000 new construction and replacement no city reported data.

Looking at capital expenditures for maintenance and reconstruction of highways we notice that San Antonio was the only city to report any data for FY 1982. For FY 1987 and FY 2000 no city reported any numbers. Finally two sources of revenue for highway new construction, and maintenance of existing highways, were user fees and general obligation bonds.

Roads

Out of the twelve cities reporting for FY 1982 only Irving showed an expenditure for new construction and maintenance of roads. The total spent on roads by Irving was $750,000, with a per capita expenditure of $6.82. Once again the major explanation for such an outcome is the fact that roads are often the responsibility of county government. For FY 1987 and FY 2000 no data was reported.

When asked about expenditures for maintenance and reconstruction of roads no municipality reported any data for either FY 1982, FY 1987 or FY 2000. Irving did not list a source of revenue for road expenditures.

Streets

As with the overall analysis, the survey results showed much more data for streets. In FY 1982 all twelve cities reported having responsibility for at least some street mileage. Again, this is one item of surface infrastructure that is commonly considered to be under the jurisdiction of local municipalities. The total number of street miles was 8991, with only San Antonio not reporting. The range for number of street miles serviced was 387 (Irving) to 1877 (Ft. Worth). Eight cities reported less than 900 street miles.

In FY 1982, 91.6 percent of the larger cities spent more than one million for new construction, replacement, and upgrading. The total spent for new construction, replacement, and upgrading was $88,093,000 with a range of $20,000,000 (Ft. Worth) to $2,500,000 (Beaumont and Irving) and a mean of $7,341,083. The per capita capital expenditure for FY 1982 ranged from $3.65 (Abilene) to $34.35 (Arlington). 33.3 percent of the municipalities had a per capita expenditure of $10.00 to $25.00 while 66.6 percent had a per capita expenditure greater than $25.00.

Looking at expenditures for maintenance and reconstruction we again found that data to be plentiful. All cities reported some expenditure on maintenance and reconstruction in FY 1982, except Amarillo. The total expenditure was $41,448,069 with a range of $1,000,000 (Garland) to $12,711,584 (San Antonio) and a mean of $3,454,006. 75 percent of the cities reported a per capita expenditure of between $10.00 and $25.00. 16 percent had a per capita expenditure of less than $10.00.

The number of cities reporting data for new construction and replacement in FY 1987 falls to nine. The range is $470,000 (Abilene) to

$33,444,000 (Austin) with a total expenditure of $96,644,000 and a mean of $10,738,000. The number of cities reporting data for maintenance and reconstruction in FY 1987 decreased to eight. The range was $4,715,786 (Austin) to $1,000,000 (Garland and Irving) with a total expenditure of $26,962,786 and a mean of $3,370,348.

As always the survey results for FY 2000 are more sparse. There were six cities reporting expenditures for new construction and replacement in FY 2000. The total was $74,020,000 with a range of $2,000,000 (Beaumont) to $30,000 (Ft. Worth) and a mean of $12,336,667. Looking at expenditures for maintenance and reconstruction in FY 2000 the number of municipalities reporting fell to five. The total outlay was $27,841,000 with a range of $1,000,000 (Garland) to $13,341,000 (Lubbock) and a mean of $5,568,000.

There were several revenue sources given for new street construction and street maintenance. Most of the twelve cities listed more than one revenue source. Local taxes were listed by 10 cities, general obligation bonds by eight cities, federal grants by four cities, and state grants by two cities. Finally, at least one city listed either revenue bonds, user fees, or revenue sharing as a revenue source.

Subsurface Infrastructure Systems

As previously mentioned, the size and scale of subsurface infrastructure systems is to every extent as complex as those above ground. The survey asked questions about water distribution systems, wastewater facilities, and drainage systems. Across these three systems we see many more figures given by the municipalities due to the fact that those systems below ground are much more likely to be the responsibilities of the cities they serve.

As will be seen, the total expenditures are comparable in size for subsurface as those of surface infrastructure. Furthermore, as the questionnaire asked for response dealing with commitments in FY 1987 and FY 2000 the data becomes more sparse.

Water Distribution Systems

All twelve of the municipalities reported that they had jurisdiction over water distribution systems. The total miles of pipes incorporated in these systems totaled 13,806 miles. The miles of pipe varied from 500 miles (Irving) to 2,740 (San Antonio). 50 percent of the cities had water distribution pipe systems of 1,000 miles or more.

In FY 1982, all municipalities reported substantial figures for capital expenditures for new construction and replacement. The range was $14,600,000 (San Antonio) to $358,000 (Abilene), with a total figure of $64,444,220 for all cities. The mean expenditure was $5,370,352. Seventy-five percent of the municipalities had expenditures of one million or more. Twenty-five percent of the municipalities had expenditures of 10 million or more. On a per capita basis three cities reported per capita expenditures of less that $10.00, six cities per capita expenditures were between $10.00 and $25.00, and four cities per capita expenditures were greater than $25.00.

Looking at FY 1982 capital expenditure for maintenance and reconstruction again there was a 100 percent response rate. The total dollar outlay here is much lower ($16,867,407) than for new construction

($64,444,220). Seven of the twelve cities (58.3 percent) spent between one million and 10 million on maintenance and reconstruction. Only two municipalities spent more than 10 million. The range in this category for total expenditure was from $4,041,786 (Austin) to $20,100 (San Antonio). The mean expenditure equaled $1,405,617. On a per capita basis seven of the 12 cities (58.3 percent) had a per capita expenditure of less than $10.00 while five cities had a per capita expenditure of between $10.00 to $25.00.

The data for projected expenditures for new construction and maintenance of existing facilities again becomes somewhat more sparse for FY 1987 and FY 2000. However, due to the jurisdictional responsibility more cities seem to be thinking about future needs in subsurface infrastructure systems. Both for new construction and maintenance there were eleven municipalities reporting some levels of capital expenditure necessity if FY 1987. Overall, the larger cities in Texas indicated an intent to spend more than twice the dollar amount in FY 1987 for new construction in water distribution ($124,800,000) than for maintenance ($54,324,000). For FY 2000 the number of municipalities responding falls to eight for new construction and nine for maintenance. Again, we notice a higher commitment to new construction than maintenance in FY 2000.

The revenue sources most likely to support new construction and maintenance in water distribution systems were user fees and revenue bonds, eleven and nine cities reporting respectively. Three cities listed general obligation bonds, while one city cited local taxes.

Waste Water Facilities

The number of municipalities reporting data in this category dropped from the 12 responding to water distribution systems to nine for waste water systems. Two units of measure were given for waste water facilities, mile facility systems and millions of gallons a day. Some cities listed only one unit of measurement while others cited both miles and MGD. At any rate, the total miles for respondents was 4,224 while the total MGD equals 424 (no response from Irving and Waco).

In FY 1982 the total expenditure for new construction and upgrading amounted to $92,836,036 with a range of $33,230 (Amarillo) to $44,108,000 (San Antonio) and a mean of $7,736,336. Eight of the nine reporting cities had one million or more going towards wastewater facilities in FY 1982. The per capita expenditure ranged from $0.22 (Amarillo) to $101.60 (Beaumont). Forty-one percent of the cities reporting had a per capita expenditure in FY 1982 of $25.00 or more.

In FY 1982 the total expenditure for maintenance and reconstruction was $38,117,567 with a range of $113,913 (Amarillo) to $26,336,514 (San Antonio) and a mean of $3,176,464. Five of the nine reporting cities spent more than one million, two cities allocated between $500,000 and $1 million, while two other cities budgeted less than $500,000. Six of the municipalities had a per capita expenditure for maintenance and reconstruction of less than $10.00, two cities had per capita spending levels of between $10.00 and $25.00, while one city showed a per capita expenditure greater than $25.00.

For new construction and maintenance categories in FY 1987 and FY 2000 seven out of twelve cities responded. It is interesting to note here is that the intended total expenditure for new construction and replacement in FY 2000 is 100 percent larger than that of 1987 ($108,150,000 vs. $53,406,000). This seems to imply an expectancy on the part of municipalities for increasing new waste water systems. Moreover, the expenditure on maintenance and reconstruction in FY 2000 is more than twice that of FY 1987 ($37,547,000 vs. $16,007,000).

The revenue sources most likely to support new construction and maintenance of waste water facilities were revenue bonds (seven cities), federal grants (eight cities), and user fees (seven cities). Two cities listed state grants and while two more cities cited general obligation bonds. Finally, one city noted local taxes as a revenue source.

Drainage Systems

The last infrastructure system that the survey addressed was that of drainage systems. As with waste water systems there were nine out of twelve cities reporting data dealing with capital expenditures for new construction, replacement and maintenance, reconstruction in FY 1982. Only seven cities made reference to the number of miles of drainage systems. The total drainage miles was 3,819 with San Antonio, Garland, Beaumont, Arlington, and Ft. Worth not reporting.

The total expenditure on new construction and upgrading was $35,855,754 in FY 1982 with a range of $67,751 (Abilene) to $19,226,000 (San Antonio) and a mean of $2,987,980. This infrastructure system appears to have received less monetary allocation than the other subsurface systems. The same holds true for maintenance and reconstruction. The total outlay was $13,326,105 with a range of $450,000 (Ft. Worth) to

$5,378,999 (San Antonio) and a mean of $1,110,509. Thirty-three percent of the cities spent less than $500,000 for new construction and replacement in drainage systems while only 8.3 percent spent less than $500,000 in water distributions and wastewater facilities. However, as with water distribution and wastewater systems, the expenditure on maintenance and reconstruction of drainage systems in most large cities was more than $1 million.

Pertaining to per capita expenditures in new construction and upgrading for drainage systems the range was $0.69 (Abilene) to $30.24 (Austin). Six of the nine cities reporting had per capita expenditures of less than $10.00, two cities had per capita expenditures of between $10.00 and $25.00, while one city said per capita expenditure was in excess of $25.00. Per capita expenditures for maintenance and reconstruction the range was $0.10 (Amarillo) to $16.93 (Beaumont). Eight of the nine cities reporting had per capita expenditures of less than $10.00.

Projections for FY 1987 and FY 2000 followed previous patterns of decreasing data availability, or unwillingness to report their projections. For FY 1987 nine cities reported a total expenditure of $33,618,000 and a mean of $3,735,000. The range was wide, from $250,000 (Waco) to $10,918,000 (San Antonio). When asked for maintenance and reconstruction figures the number of cities reporting fell to seven, Table J. Total expenditures dropped by approximately 60 percent from that of new construction and replacement ($10,379,745 vs. $33,618,000). As always the data on FY 2000 projections was extremely sparse.

Sources of revenues for drainage systems came from local taxes (5 cases), general obligation bonds (7 cases), revenue bonds (3 cases), federal grants (3 cases), and user fees (5 cases).

The following set of tables set forth the previously described survey responses from Texas' largest cities. Tables IV-21 through IV-23 depict the total expenditures for each infrastructure category reported by these cities for maintenance and reconstruction in FY 1982, 1987, and 2000 respectively. In like fashion, Tables IV-24 through IV-26 demonstrate the responses of cities for new construction, replacement and upgrading of their infrastructure systems for the same time periods.

Thought these data are by no means comprehensive, they do reflect the magnitude of Texas' large city infrastructure expenditures and the difficulty encountered by even the most sophisticated cities' budgeting and public works officials when trying to project future needs. Perhaps the most useful information gleened from this survey effort concerns the woefully inadequate state of infrastructure information systems. While it is clear that all cities recognize the need for substantial investments in infrastructure systems, without a more concerted inventory and planning program, there can be no assurance that the full dimension of the problem is known. The absence of such a program will only insure that expenditures and priorities will to be both random and inadequate.

Table IV - 21

Total (and Per Capita) Maintenance and Reconstruction (FY 1982)

City	Bridges	Hwy.	Roads	Streets	Water Dist.	Waste Water	Drainage
San Antonio	--	7,000,000 (8.91)	--	12,711,584 (16.18)	20,100 (.02)	26,336,514 (33.53)	5,378,999 (6.85)
Ft. Worth	--	--	--	6,690,000 (17.37)	2,500,000 (6.49)	1,600,000 (4.51)	450,000 (1.17)
Austin	100,000 (.29)	--	--	3,209,485 (9.29)	4,041,786 (11.70)	984,602 (2.85)	2,028,000 (5.87)
Corpus Christi	--	--	--	3,980,000 (17.15)	1,400,000 (6.03)	4,800,000 (20.70)	1,120,000 (4.83)
Lubbock	--	--	--	2,932,000 (16.85)	312,000 (1.79)	209,000 (1.20)	--
Arlington	--	--	--	3,000,000 (18.73)	1,690,000 (10.55)	--	--
Amarillo	--	--	--	--	363,521 (2.44)	113,913 (.76)	14,609 (.10)
Garland	1,000,000 (7.20)	--	--	1,000,000 (7.20)	500,000 (3.60)	1,000,000 (7.20)	--
Beaumont	100,000 (.85)	--	--	1,900,000 (16.09)	1,640,000 (13.88)	2,160,000 (18.29)	2,000,000 (16.93)
Irving	3,000 (.03)	--	--	1,225,000 (11.43)	1,500,000 (13.64)	--	1,000,000 (9.10)
Waco	--	--	--	2,400,000 (23.70)	1,000,000 (9.88)	--	800,000 (7.90)
Abilene	--	--	--	2,400,000 (24.41)	1,900,000 (19.33)	913,000 (9.29)	534,497 (5.44)
TOTAL	1,203,000	7,000,000		41,448,069	16,867,407	38,117,567	13,326,105
MEAN				3,454,006	1,405,617	3,176,464	1,110,509

Table IV - 22

Total Expenditure Maintenance and Reconstruction (FY 1987)

City	Bridges	Hwy.	Roads	Streets	Water Dist.	Waste Water	Drainage
San Antonio	--	--	--	--	32,600,000	--	--
Ft. Worth	--	--	--	--	2,700,000	2,000,000	--
Austin	200,000	--	--	4,715,786	5,774,000	1,797,000	2,978,000
Corpus Christi	--	--	--	7,100,000	1,800,000	7,000,000	2,100,000
Lubbock	700,000	--	--	4,447,000	450,000	340,000	300,000
Arlington	--	--	--	--	2,700,000	--	--
Amarillo	--	--	--	--	--	--	--
Garland	1,000,000	--	--	1,000,000	500,000	1,000,000	--
Beaumont	150,000	--	--	2,000,000	2,000,000	2,500,000	2,000,000
Irving	3,000	--	--	1,000,000	1,700,000	--	1,200,000
Waco	--	--	--	3,100,000	1,250,000	--	1,000,000
Abilene	--	--	--	3,600,000	2,850,000	1,370,000	801,745
TOTAL	2,053,000			26,962,786	54,324,000	16,007,000	10,379,745
MEAN	410,600			3,370,348	4,938,545	2,286,714	1,482,820
	N=5			N=8	N=11	N=7	N=7

Table IV - 23

Total Expenditure Maintenance and Reconstruction (FY 2000)

City	Bridges	Hwy.	Roads	Streets	Water Dist.	Waste Water	Drainage
San Antonio	--	--	--	--	144,500,000	--	--
Ft. Worth	--	--	--	--	3,900,000	3,000,000	--
Austin	200,000	--	--	--	15,703,000	4,887,000	--
Corpus Christi	--	--	--	--	2,900,000	20,000,000	--
Lubbock	700,000	--	--	13,341,000	1,400,000	1,160,000	900,000
Arlington	--	--	--	--	--	--	--
Amarillo	500,000	--	--	7,000,000	--	--	--
Garland	1,000,000	--	--	1,000,000	1,000,000	1,000,000	--
Beaumont	200,000	--	--	2,000,000	4,500,000	5,500,000	2,000,000
Irving	--	--	--	--	--	--	--
Waco	--	--	--	4,500,000	1,600,000	--	1,800,000
Abilene	--	--	--	--	4,300,000	2,000,000	1,200,000
TOTAL	1,700,000			27,841,000	179,803,000	37,547,000	5,900,000
MEAN	566,666			5,568,000	19,978,000	5,363,000	1,475,000
	N=3			N=5	N=9	N=7	N=4

Table IV - 24

Total (and Per Capita) New Construction, Replacement and Upgrading (FY 1982)

City	Bridges	Hwy.	Roads	Streets	Water Dist.	Waste Water	Drainage
San Antonio	--	64,600,000 (82.25)	--	9,214,000 (11.73)	14,600,000 (18.58)	44,108,000 (56.16)	19,226,000 (24.48)
Ft. Worth	275,000 (.71)	--	--	20,000,000 (51.93)	12,500,00 (32.46)	10,650,000 (27.65)	2,500,000 (6.49)
Austin	3,320,000 (9.60)	--	--	18,449,000 (53.39)	4,558,817 (13.19)	2,777,702 (8.04)	10,448,000 (30.24)
Corpus Christi	--	--	--	9,200,000 (39.66)	3,600,000 (15.52)	7,600,000 (32.76)	1,700,000 (7.33)
Lubbock	--	--	--	2,700,000 (15.52)	14,500,000 (83.34)	3,500,000 (20.12)	--
Arlington	--	--	--	7,750,000 (48.40)	5,500,000 (34.35)	5,000,000 (31.23)	--
Amarillo	--	--	--	4,300,000 (28.81)	926,480 (6.21)	33,230, (.22)	164,003 (1.10)
Garland	100,000 (.72)	--	--	6,000,000 (43.21)	1,000,000 (7.20)	--	--
Beaumont	--	--	--	2,500,000 (21.17)	1,200,000 (10.16)	12,000,000 (101.60)	1,200,000 (10.16)
Irving	275,000 (2.50)	10,000,000 (90.96)	750,000 (6.82)	2,500,000 (22.74)	2,700,000 (24.56)	--	300,000 (2.73)
Waco	--	--	--	2,980,000 (29.43)	3,000,000 (29.63)	--	250,000 (2.47)
Abilene	160,000 (1.63)	--	--	2,500,000 (25.42)	358,923 (3.65)	7,167,104 (72.90)	67,751 (.69)
TOTAL	4,130,000	74,600,000	750,000	88,093,000	64,444,220	92,836,036	35,855,754
MEAN	344,167			7,341,083	5,370,352	7,736,336	2,987,980

Table IV - 25

Total Capital Expenditure New Construction, Replacement and Upgrading (FY 1987)

City	Bridges	Hwy.	Roads	Streets	Water Dist.	Waste Water	Drainage
San Antonio	--	64,200,000	--	--	45,300,000	4,356,000	10,918,000
Ft. Worth	500,000	--	--	25,000,000	16,000,00	15,000,000	5,000,000
Austin	5,965,000	550,000	--	33,444,000	22,500,000	8,850,000	2,050,000
Corpus Christi	--	--	--	12,300,000	18,200,000	7,000,000	2,000,000
Lubbock	--	--	--	3,000,000	9,000,000	9,200,000	6,000,000
Arlington	--	--	--	--	5,800,000	7,000,000	--
Amarillo	--	--	--	--	--	--	--
Garland	100,000	--	--	12,000,000	1,000,000	--	--
Beaumont	200,000	--	--	2,000,000	2,500,000	2,000,000	1,400,000
Irving	--	--	--	5,000,000	1,000,000	--	1,000,000
Waco	--	--	--	3,430,000	1,000,000	--	250,000
Abilene	220,000	--	--	470,000	2,500,000	--	5,000,000
TOTAL	6,985,000	64,750,000		96,644,000	124,800,000	53,406,000	33,618,000
MEAN	1,397,000	32,375,000		10,738,000	11,345,000	7,629,000	3,735,000
	N=5	N=2		N=9	N=11	N=7	N=9

Table IV - 26

Total Capital Expenditure New Construction, Replacement and Upgrading (FY 2000)

City	Bridges	Hwy.	Roads	Streets	Water Dist.	Waste Water	Drainage
San Antonio	--	--	--	--	20,000,000	--	--
Ft. Worth	1,000,000	--	--	30,000,000	26,000,00	25,000,000	10,000,000
Austin	--	--	--	--	32,000,000	16,150,000	--
Corpus Christi	--	--	--	15,000,000	25,000,000	12,000,000	2,500,000
Lubbock	--	--	--	10,000,000	150,000,000	35,000,000	--
Arlington	--	--	--	--	--	--	--
Amarillo	--	--	--	--	--	--	--
Garland	100,000	--	--	12,000,000	--	--	--
Beaumont	200,000	--	--	2,000,000	20,000,000	10,000,000	1,200,000
Irving	--	--	--	--	--	--	--
Waco	--	--	--	5,020,000	1,000,000	--	500,000
Abilene	--	--	--	--	10,000,000	10,000,000	8,000,000
TOTAL	1,300,000			74,020,000	284,000,000	108,150,000	22,200,000
MEAN	433,333			12,336,667	35,500,000	15,450,000	3,703,000
	N=3			N=6	N=8	N=7	N=6

CHAPTER V

FINANCING FUTURE INFRASTRUCTURE NEEDS

A. INTRODUCTION

Estimates of future infrastructure needs have been made by the responsible state agencies for the major systems, as presented in Chapter III. Although there has been an attempt to project needs in a systematic and comprehensive fashion, the projections are useful primarily in the context of one system--not in the aggregate, and for purposes limited by the assumptions used in the projection methodologies. It is extremely difficult, therefore, to make judgments of future needs based on aggregate data for all of the major systems. For sub-state jurisdiction, the problem of aggregate projections for different systems is compounded by the lack of sufficient data. As we have indicated elsewhere, the divided responsibilities for different systems at the local level nearly precludes effective planning and coordinating in the provision of infrastructure systems.

If estimates of costs for future infrastructure are frought with uncertainty, assessing the availability of funds to pay the costs--whatever they ultimately may be--of future needs is highly speculative. Projections of revenue necessarily must be based on projections of other factors--population, personal income, resource production and prices--which themselves require numerous assumptions about future state, national and world conditions. In addition, revenue projections must be based on the current tax structure of the state and on tax rates. Future revenues to meet any gap between estimates of need and available resources could be raised in a number of ways: by changing the tax structure; changing the rates of the existing structure; non-tax financing; improving the performance of the economy; or achieving higher levels in the productivity of government workers, and increasing the life-cycle of physical infrastructure systems. Therefore, consideration of a revenue gap relative to funding of infrastructure must be qualified by several conditions.

First, a future revenue gap should not be equated with a spending deficit. The State of Texas cannot constitutionally operate with a deficit. The revenue gap simply points to certain needs that could be unmet if steps are not taken to alter the size of future revenues or to change spending priorities within the existing system. Second, because local government accounts for well over one half of total government spending in Texas and is the primary provider of several major infrastructure systems, a state-level revenue gap cannot reflect an accurate picture of total needs in the state. In the absence of reliable data, the total need for infrastructure systems that will have to be met by all levels of government cannot be known. Third, even though total needs cannot be estimated for all levels of government and any projected revenue gap is highly qualified, judgments can nevertheless be made based on available data that there is and will continue to be requirements for infrastructure spending in excess of current revenues.

Perhaps the most important characteristic of projecting future revenue needs is the resulting attention directed at the basic assumptions used in the projection techniques. Examination of the assumptions can assist policy makers in their understanding of the major forces affecting the health of the state economy and the relative productivity and fairness of different revenue measures. Understanding the nature of a future mis-match between revenues and needs can assist in the reassessment of current priorities.

For purposes of this review of what is known about infrastructure needs in Texas, therefore, this section presents a brief overview of the structure of the state revenue system, its relationship to infrastructure financing, and projections to the year 2000. Aspects of the local government revenue system are also presented to round out the picture.

A. STRUCTURE OF THE STATE REVENUE SYSTEM

1. Major Revenue Sources and Trends

As in the case for most states, Texas relies on numerous sources of wealth and spending to generate revenues on a biennial basis. These sources include sales taxes, highway taxes and fees, business taxes, energy taxes and income from interest, land and a hodge-podge of fees, permits, fines and the like. As shown in Table V-1, tax collections account for nearly two-thirds of total receipts, with federal government transfers accounting for one-fifth. Because revenue is deposited in about 300 funds, each with numerous restrictions on use, most analyses of state revenue are concerned primarily with what are commonly referred to as "major funds." These are: the general revenue fund, state highway fund, highway motor fuel tax fund, and the foundation school fund. These funds account for about 70% of all state expenditures. Table V-2 shows the revenue and expenditures for these major funds during the last eight biennia.

TABLE V-1

REVENUE DISTRIBUTION IN TEXAS BY RECEIPT TYPE: FISCAL YEAR 1983

Receipt Type	Percent of Total
Tax Collections	62.0
Business/Professional Fees	0.4
Noncommercial Licenses and Permits	2.9
Violations, Fines and Penalties	0.3
State Service Fees	0.7
Sales, Rentals and Repayments of Goods and Services	0.4
Federal Receipts	20.4
Interest/Dividends	6.5
Land Income	5.2
Other Receipts	1.2
TOTAL REVENUE ($14,315.6 million)	100.0%

Source: Texas Comptroller of Public Accounts, 1984-1985 Biennial Revenue Estimate, p. 4.

TABLE V-2

REVENUES AND EXPENDITURES FOR MAJOR FUNDS (1)

1968-69 TO 1984-1985
(Amount in Millions)

	Revenue			Expenditure			Major Funds	Notation:(2)
		Increase			Increase		Ending	General Revenue
Biennium	Total	Amount	%	Total	Amount	%	Cash Balance	Balance
1968-69	$ 3,214.3	$ n.a.	n.a.	$ 3,254.6	$ n.a.	n.a.	$ 148.7	$ 94.5
1970-71	4,280.7	1,066.4	33.2	4,248.4	993.8	30.5	181.0	115.1
1972-73	5,639.2	1,358.5	31.7	5,410.1	1,161.7	27.3	410.1	205.8
1974-75	7,311.6	1,672.4	29.7	6,855.9	1,445.8	26.7	865.8	775.5
1976-77	9,364.5	2,052.9	28.1	9,156.7	2,300.8	33.6	1,073.6	945.1
1978-79	11,765.6	2,401.1	25.6	12,102.3	2,945.6	32.3	736.9	620.3
1980-81	15,753.4	3,987.8	33.9	15,565.9	3,463.6	28.6	925.4	675.6
1982-83	19,570.0	3,816.6	24.2	19,508.3	3,942.4	25.3	989.1	956.6
Estimate of the amount available for appropriation under pay-as-you-go								
1984-85	22,756.0	3,186.0	16.3	24,150.6	4,642.3	23.8	30.0	0

1. The revenue and expenditure flow through the major funds are the core of the state's financial system. The preceding pages show that these funds are linked through a complex series of transfers and allocations which echo automatically in the General Revenue Fund. The above table is a summary of the growth in major funds revenues and expenditures.

2. The state's current biennium (FY82-83) ends August 31, 1983. The "Major Funds Ending Cash Balance" includes assets which are not available for appropriation; therefore, the General Revenue Fund Balance is the figure commonly referred to as "the surplus" and is included in the amount available for appropriation.

Source: Legislative Budget Board LBO 1-19-83

Of interest is the rate of revenue and expenditure growth during this period, averaging well above 25% each biennium. In part this reflects the state's benefit from increasing oil and natural gas prices. Taxes from these resources account for over one quarter of all state revenues. This also makes the state revenue system vulnerable to energy price decreases, a trend that had a major affect on the current state budget. The importance of energy resource taxes is shown on Table V-3, along with the other categories of revenue comprising the major funds.

2. Funding of Infrastructure

There are several ways to look at infrastructure funding based on available data, but none of them are satisfactory for comprehensive planning purposes. Although there is no overall capital budget in Texas, examining capital outlays for each department having responsibility for some element of the total infrastructure system provides perhaps the best available measure of infrastructure spending. Table V-4 shows these spending levels for 1981 to 1983 and the amounts recommended for 1984 and 1985 by the Texas Legislative Budget Board. As indicated, total infrastructure spending (excluding water development bonds) during this period may average approximately one-and-a-half billion dollars, or about 11% of total state spending. Of particular interest is the declining percentage of total spending--from 14.2% to 9.1%--experienced and planned for capital investments in basic infrastructure. This is largely accounted for by the expected decline in highway construction.

TABLE V-3

BIENNIAL REVENUE ESTIMATE
MAJOR FUNDS REVENUE, 1982-1985
(Amounts in Millions)

Source of Revenue	1982-1983	1984-1985	Percent Change
Sales Tax	$ 7,084.9	$ 8,675.8	22.5%
Oil Production and Regulation Taxes	2,474.7	2,403.8	- 2.9
Natural Gas Production Tax	2,156.5	2,580.7	19.7
Motor Fuels Taxes	1,018.6	1,130.3	11.0
Cigarette and Tobacco Taxes	701.4	740.0	5.5
Motor Vehicle Sales and Rental Taxes	1,206.2	1,429.4	18.5
Corporation Franchise Tax	1,001.4	1,240.8	23.9
Alcoholic Beverages Tax	470.7	567.3	20.5
Insurance Occupation Tax	384.8	424.7	10.4
Inheritance Tax	194.9	197.1	1.1
Hotel and Motel Tax	87.0	109.6	26.0
Utility Taxes	398.8	509.8	27.8
Telephone Tax	168.9	208.2	23.3
Interest on Investments	610.5	767.3	25.7
Interest on Deposits	359.0	419.9	17.0
Motor Vehicle Registration Fees	560.0	606.6	8.3
Other Revenue	691.5	744.8	7.7
Total Available Major Funds Revenue	$19,570.0	$22,756.0	16.3%
Ending Balance in General Revenue—August 31, 1983		956.6	
TOTAL AVAILABLE FOR CERTIFICATION		$23,712.6	

Note: Totals may not add due to rounding.

Source: Table 2 in 1984-1985 Biennial Revenue Estimates, 68th Legislature, Texas Comptroller of Public Accounts, January 1983.

TABLE V - 4
STATE OF TEXAS INFRASTRUCTURE EXPENDITURES AND RECOMMENDED BUDGET LEVELS 1981 TO 1985
(Thousands of Dollars)

	Expended		Budgeted	Recommended	
	1981	1982	1983	1984	1985
Aeronautics Commission					
Aviation Facilities Development	1424	2887	3701	5097	5441
Department of Corrections Building Program	42316	126628	140367	188926	23607
Dept. of Highways & Public Transportation					
a. Highway Maintenance	324558	347675	414133	426879	456997
b. Highway Construction	1213246	909076	1023988	917053	959430
c. Public Transportation Development	14027	11547	12145	31008	533
Dept. of Parks & Wildlife					
a. Wildlife, Land Acquisition, Lease or Construction, Repair & Rehabilitation	148	1408	2422	1438	1389
b. Park System Planning & Acquisition	2048	5148	8708	4899	4995
c. Park Design & Development	12343	5138	24621	12922	12570
Dept. of Water Resources(1)					
a. Water Development Loans	14135(1)				
b. Water Quality Enforcement Loans	12277(1)				
TOTAL - Infrastructure Expenditures	1610110	1409507	1630085	1588222	1464962
TOTAL - Executive and Administrative Departments and Agencies	3010516	3045966	3527213	3856421	3901053
TOTAL - All State Government	11354038	12469128	14134579	15342355	16071460
Infrastructure Expenditures as a Percent of Total Executive & Administrative Departments & Agencies	53.5	46.3	46.2	41.2	37.6
Infrastructure Expenditures as a Percent of Total State Government	14.2	11.3	11.5	10.4	9.1

Source: Compiled from Legislative Budget Estimates for the 1984-1985 Biennium, prepared by the Texas Legislative Budget Board, January 1983.

Note: (1) Water development and water quality enhancement loans not included in totals as they are off-budget expenditures authorized by Texas Constitution. See text for more complete discussion.

Another way of measuring infrastructure spending is provided by the data in Table V-5 showing net expenditures by object for the period 1978-1982. In these categories, capital outlays and payment of principal and interest on indebtedness approximate infrastructure funding. In terms of numerical values, the data for 1981 and 1982 are relatively comparable to the data in Table V-4. In both instances, capital outlays and related expenditures are in the 14$ and 11% ranges, respectively. The relative decline in capital outlays planned for 1984 and 1985 is even more striking when viewed in the ten-year sweep represented by the two tables.

Funding by the state of water development projects, including sewer systems and water quality enhancement, has historically been a small portion of total waterworks spending. Table V-6 shows the sources and methods of funding water systems from 1977 to 1981. The state share has never reached 5% of the total. State funding assistance to local jurisdictions having water system responsibility has been in the form of water development and water quality enhancement loans, authorized by the Texas constitution.

Table V-5

NET EXPENDITURES(1) BY OBJECT, 1978-1982

Funds 1-899
Year Ended August 31

OBJECT CATEGORY	1978	1979	1980	1981	1982
Salaries and Wages	$1,790,379,213	$1,913,133,992	$ 2,117,064,546	$ 2,349,708,510	$ 2,715,931,031
Other Personal Services(2)	579,456,266	702,429,597	887,564,123	1,008,573,497	1,193,574,199
Consumable Supplies and Materials	185,307,315	212,973,496	263,531,826	276,465,340	310,663,624
Current and Recurring Operating Expenses	356,230,459	371,034,418	398,284,084	457,398,113	531,348,395
Assistance and Medical Care for Needy	1,024,350,490	1,178,059,409	1,250,771,749	1,513,149,087	1,416,245,213
Foundation School Program Grants	2,054,469,915	2,106,376,925	2,591,361,347	2,864,339,685	3,218,166,450
Other Public Education Grants	374,915,236	478,306,608	503,549,766	619,899,213	535,060,711
Grants to Higher Education	246,265,701	343,874,064	331,708,901	326,390,052	403,710,056
Other Grants	263,588,285	293,248,305	329,168,488	349,511,412	394,744,556
Payment of Principal on Indebtedness	95,620,000	49,625,000	51,820,000	57,795,000	61,664,991
Payment of Interest and Other Claims	57,305,759	57,433,124	57,313,168	61,839,585	70,653,100
Capital Outlay for Highways	581,213,449	615,272,735	1,086,237,031	1,121,160,911	776,464,405
Capital Outlay for Land and Buildings	112,812,266	123,143,688	144,568,670	190,499,878	213,247,624
Other Capital Outlay	134,181,678	155,256,739	197,963,815	170,823,548	232,730,114
TOTAL NET EXPENDITURES	$7,864,096,032	$8,600,168,100	$10,210,907,514	$11,367,553,831	$12,074,204,469
Infrastructure as Percent of Total(3)	12.5	11.6	15.1	14.1	11.2

(1) Excludes some expenditures not cleared through the Comptroller's Office.
(2) Includes pensions and worker's compensation payments.

Source: 1982 Annual Financial Report
State Comptroller of Public Accounts.

(3) Includes payments of principal on indebtedness, interest and other claims, capital outlays for highways, land and buildings, and other capital outlays not specified.

TABLE V - 6

Sources and Methods of Funding for Waterworks and Sewer Facilities in Texas
Years 1977, 1978, 1979, 1980, and 1981

	1977		1978		1979		1980		1981	
	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
	-----------	-----------	-----------	-----------	(thousands of dollars)	-----------	-----------	-----------	-----------	-----------
Federal Funds[*]										
Bureau of Reclamation	23,027		28,584		21,563		26,989		22,782	
Corps of Engineers	27,630		47,130		43,260		53,150		49,630	
Environmental Protection Agency	143,465		105,753		107,074		102,152		109,500	
Farmers Home Administration	53,790		42,439		66,189		63,175		58,394	
Subtotal	247,912	36.52	223,906	38.46	238,086	26.87	245,466	24.54	240,306	36.96
Public Market Financing										
Revenue Funds	246,621		130,975		420,065		574,451		220,245	
General Obligations Bonds	32,783		37,194		37,942		43,656		49,135	
Water District Bonds	121,831		162,892		170,570		128,536		114,056	
Subtotal	401,235	59.11	331,061	56.86	628,577	70.94	746,643	74.65	383,436	58.98
Texas Water Development Board										
Water Development Loans	19,339		18,135		15,198		2,655		14,135	
Water Quality Enhancement Loans	5,360		6,510		4,197		5,450		12,277	
Storage Acquisition	4,978		2,619		—		—		—	
Subtotal	29,677	4.37	27,264	4.68	19,395	2.19	8,105	0.81	26,412	4.06
Total	678,824	100.00	582,231	100.00	886,058	100.00	1,000,214	100.00	650,154	100.00

[*] Data about grants and loans from other Federal agencies not available at this time.

Source: TDWR/P&DD, 10/19/82.

C. LOCAL GOVERNMENT SPENDING FOR INFRASTRUCTURE

As discussed earlier, aggregate data on local government revenue and expenditures is not suitable for detailed analysis and projections of infrastructure needs. At best, one is only able to determine approximations of relative levels of effort based on limited data, in terms of both scope and periods of time covered. For example, Table V-7 shows infrastructure related county, municipality and special district expenditures for 1977, derived from the 1977 U.S. Census of Governments. For that year, the total for infrastructure represents about one third of total local government spending, a level that is comparable with the expenditure levels reported in the previous U.S. Census of Governments in 1972. Deleting the federal and state share for highways, sewerage and water systems, the expenditure level drops to about 23% of total spending that must be accounted for by direct local revenues.

D. REVENUE NEEDS TO THE YEAR 2000

Because of the incompleteness of existing data and the lack of comparability among sources of information about needs and future revenues, projections to the year 2000 must ben ecessarily limited in scope. Basic information that is available pertains primarily to highways, bridges, water and wastewater systems. Table V-8 summarizes infrastructure expenditure requirements from data presented in Chapter III. The total estimated need for highways and bridges in the State system to the year 2000 is $58.4 billion, in 1982 dollars. Water and wastewater system needs are projected to require an expenditure of $11.6 billion, for a total of $70 billion for the major systems.

TABLE V - 7

INFRASTRUCTURE RELATED COUNTY, MUNICIPALITY AND SPECIAL DISTRICT EXPENDITURES IN TEXAS: 1977

(Millions of Dollars)

Function	County	Municipality	Special District	Total
Highways	$184.8	$248.6	N/A	$433.4
Sewerage	-0-	258.2	$208.6	466.8
Sanitation-Other	2.4	112.3	0.3	115.0
Airports	2.7	47.0	24.9	74.6
Water, Transportation, Terminals and Other	2.0	17.8	57.2	77.0
Corrections	52.9	3.8	-0-	56.7
General Public Buildings	47.6	36.9	105.4	189.9
Water Utilities	N/A	366.4	N/A	366.4
Other Utilities	N/A	800.2	N/A	800.2
TOTAL	$292.4	$1,891.2	$396.4	$2,580.0
TOTAL LOCAL GOVERNMENT SPENDING				$7,900.0
Infrastructure Related Spending as Percent of Total Spending				32.6%

Source: Derived from Texas 2000, Texas Trends, Office of the Governor, August 1980, Tables II-3 and II-30.

TABLE V - 8

INFRASTRURE EXPENDITURE REQUIREMENTS FOR SELECTED SYSTEMS: 1982 - 2000
(Millions of 1982 Dollars)

Highways and Bridges		
Administrative and Support	$ 1,242	
Maintenance	8,130	
Rehabilitation	8,190	
Construction and Reconstruction	38,728	
Auxiliary Operations	1,428	
Public Transportation	644	
Sub-Total		$58,362
Water and Wastewater Systems		
Wastewater Treatment	$ 5,669	
Wells and Facilities	895	
Raw Water	633	
Major Water Conveyance	1,239	
Water Supply Facilities	410	
Reservoirs	2,790	
Sub-Total		$11,636
TOTAL		$69,998

Source: Data derived from basic documents of SDHPT and DWR. See pages Operational Planning Study, July 1982, and Water for Texas: Planning for the Future, February 1983.

Projection of future expenditure levels based on the current state tax structure are summarized in Table V-9. The projections, in 1982 dollars, are based on a study by the Texas Research League in May 1982, Public Revenues from Oil and Natural Gas in Texas: What Lies Ahead? Using population projections generated by the Texas 2000 project, the Texas Research League (TRL) projected the cost of state government based on estimates of future personal income and historical relationships between total personal income and total state spending. The results of the TRL work were summarized and are presented here as Table V-10. The TRL analysis and data are in 1979 dollars; they were converted to 1982 dollars for purposes of this reconnaissance of information about state infrastructure needs.

Based on current levels of spending and the TRL projections to the years 1990 and 2000, average annual growth rates were calculated to generate total spending for the eighteen-year period, 1982-2000. From 1979 to 1990, the projected annual rate of growth in state spending is 4.24%. From 1990 to 2000, the rate is 5.3%. Using these rates, total state spending for the period is projected to be $479 billion. An estimate of future capital outlays for major infrastructure systems was based on the historical share of state spending for these purposes, as presented in Tables V-4 and V-5. Although the share of spending for infrastructure has been declining from 12-15% to 9-10%, we assumed that the major component of these expenditures, highways and bridges, would stabilize around 11 percent for the period. This factor would yield revenues of about $53 billion for the 1982-2000 period, as shown on Table V-9.

TABLE V - 9

PROJECTED STATE AND LOCAL GOVERNMENT EXPENDITURES FOR SELECTED INFRASTRUCTURE CAPITAL OUTLAYS BASED ON CURRENT PATTERNS: 1982-2000

(Millions of 1982 Dollars)

Infrastructure Expenditures	
Highways and Bridges	
State Expenditures	$52,732
Water and Wastewater Systems	
State (Available Bond Funds)	221
Local	6,758
TOTAL	$59,711

Source: See text for description of projection methods.

Table V-10

Example of Calculations Used to Determine if Projected State Taxes Will be Large Enough to Cover Projected State Spending in 1990 and 2000

	1990	**2000**
1. Estimated population	17,703,000.	22,091,000
2. Projected total personal income	$208.1 billion	$349.0 billion
3. Projected cost of state government (8.5% of total income)	$17.69 billion	$29.34 billion
4. Percentage of cost covered by federal aid + state taxes	89.0%	89.0%
4a Percentage from federal aid	24.0%	23.0%
4b Percentage from state taxes	65.0%	66.0%
5. State tax "need" (required to balance spending; line 3 times line 4b)	$11.50 billion	$19.58 billion
6. Projected state taxes:		
6a High growth taxes (2.65% of 1990 income; 2.8% of 2000)	$ 5.51 billion	$ 9.77 billion
6b Low growth taxes ($97 per capita in 1990; $112 in 2000)	1.72 billion	2.47 billion
6c Other taxes (0.55% of 1990 income; 0.50% of 2000)	1.14 billion	1.74 billion
6d Severance Taxes:		
TENRAC oil at higher price	1.46 billion	2.01 billion
TENRAC natural gas	2.10 billion	2.85 billion
TOTAL TAXES PROJECTED	$11.93 billion	$18.84 billion
7. Compare to tax "need," line 5. A + indicates the total of line 6 (TOTAL TAXES PROJECTED) is *greater* than line 5 and the resultant figure is referred to as a "surplus." Brackets [ ] indicate that the total of line 6 is *less* than line 5 and the resultant figure is referred to as a "deficit."	$ + 0.43 billion	$[0.74] billion

Source: Table 11 in its entirety from Texas Research League, Public Revenuew from Oil and Natural Gas in Texas: What Lies Ahead?, May 1982, page 29.

Note: All spending and tax projections are in 1979 dollars.

Projected expenditures for water and wastewater systems are based on the planning study of the Texas Department of Water Resources, cited in Chapter III. These estimates of future revenue are listed separately because they are not contained in data on state capital spending. The $221 million available from the state is the balance of constitutionally authorized bonds totalling $600 million for water development and water quality enhancement projects. The local share is based on recent experience of local contributions to water projects. Because of the uncertainty of federal assistance, the projected expenditures do not include the anticipated federal share.

A comparison of the expenditure needs and revenue analysis is shown in Table V-11. Total expenditure needs for major systems is shown as about $70 billion. Against this figure revenues are projected to total $59.7 billion, resulting in an unmet need of $10.3 billion, a shortfall of nearly $600 million per year from now to the year 2000. Considering the recent relative decline in state spending for infrastructure, this projected shortfall would appear to be a conservative estimate.

Table V-11 also shows projected local government expenditures for infrastructure systems (other than the local share of water system already indicted). This projection of nearly $80 billion is based on projected local government total expenditures, assuring an average annual growth rate of about 3%--the growth rate throughout the 1970's, and on the assumption that infrastructure expenditures will approximate the relative levels of 1972 and 1977, slightly over 20%, the most recent years for which reliable data exist. However, this assumes that future needs are determined by past expenditure levels; considering deferred maintenance problems, continued

TABLE V - 11

POSSIBLE UNMET REVENUE NEEDS FOR SELECTED INFRASTRUCTURE SYSTEMS OF STATE AND LOCAL GOVERNMENTS: 1982-2000

(Millions of 1982 Dollars)

	Expenditure Needs	Revenues	Unmet Needs
Highways and Bridges			
State Expenditures	$58,362	$52,732	$ 5,630
Water and Wase tewater Systems			
State			
Local	11,636	6,979	4,657
Other Local Government Expenditures	79,702	(1)	(1)
Total (Excluding Other Local Government)	$69,998	$59,711	$10,287

Source: See text for description of methods.

Note: (1) Revenue projections for other local government infrastructure expenditures could not be estimated because of insufficient data on current patterns.

growth, and increasing obsolescence of older systems, it seems that here, too, the past leads to conservative estimates of future need. Finally, projection of aggregate revenue for local government infrastructure could not reasonably be estimated on the basis of existing information. Not only is the data not available, revenue raising measures by local governments are extremely difficult to predict, even if all cpaital bond programs were known. The people of Dallas and surrounding communities, for example, recently enacted a sales tax override measure to generate $8.75 billion for a regional transportation system, including some form of high speed rail or fixed guideway movement by 2010. This would be the first modern system constructed without planned federal participation, and would have been difficult to assess prior to a recent vote on the subject. Other local needs undoubtedly will be met in similar fashion in the coming years. And, of course, some will not.

APPENDIX A

STATE OF TEXAS

Survey of Infrastructure Needs

Name of City____

Name of Chief Administrative Officer________________________

Address____

Phone____

Please Note:

Each question uses a similar scheme for classifying infrastructure needs. However, all local government organizations may not use this particular scheme. For example, some may not consider drainage and wastewater facilities to be separate systems. To the extent possible, please try to provide need and cost estimates which "fit" the classifications used in the survey. If this proves very difficult, however, please provide the relevant information in whatever format is normally used. In addition, there may be some differences among local governments in how costs are presented. Please indicate whether current or constant dollars are used, and if constant, the base year used for calculation. Thank you.

SECTION I

Bridges, Highways, Roads & Streets

For each of the basic infrastructure categories listed in the following matrix please indicate:

1. The number of miles of roadway or the number of bridges under the jurisdiction of this local government (as unit of measurement);
2. The level of capital expenditure this local government has devoted to new construction, replacement or upgrading each of these infrastructure systems during FY 1982;
3. The projected level of capital expenditures this local government expects to spend on new construction, replacement or upgrading of these systems in FY 1987 and FY 2000. If these years do not coincide with this local government's planning process, please substitute your own periods in your response.
4. The level of capital expenditure this government has devoted to maintenance during FY 1982.
5. The projected level of capital expenditure this government expects to spend for maintenance of these basic infrastructure systems in FY 1987 and FY 2000. If these years do not coincide with this government's planning process please substitute your own periods in your response.
6. Please indicate the sources of the revenues utilized by this local government to meet these basic infrastructure needs using the following key: 1 = local taxes, 2 = general obligation bonds, 3 = revenue bonds, 4 = state grants, 5 = federal grants, 6 = user fees, 7 = other (please specify).

INFRASTRUCTURE CATEGORY	UNIT OF MEASURE	CAPITAL EXPENDITURE FOR NEW CONSTRUCTION, REPLACEMENT, UPGRADING			SOURCES OF REVENUE	EXPENDITURE FOR MAINTENANCE AND RECONSTRUCTION			SOURCES OF REVENUES
		FY 1982	FY 1987	FY 2000		FY 1982	FY 1987	FY 2000	
BRIDGES									
HIGHWAYS (State)									
ROADS (County)									
STREETS (Local)									

SECTION II

Water Distribution Systems, Wastewater Facilities, Drainage Systems

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For each of the basic infrastructure categories in the matrix below please provide the following information:

1. The number of miles of pipe in the water distribution and drainage systems, and the total capacity (in Millions of Gallons per Day) of the wastewater facilities under the jurisdiction of this local government (as units of measurement).

2. The level of capital expenditure this local government has devoted to new construction, replacement or upgrading each of these infrastructure systems during FY 1982.

3. The projected level of capital expenditures this local government expects to spend on new construction, replacement or upgrading these systems in FY 1987 and FY 2000. If these years do not coincide with this local government's planning process, please substitute your own periods in your response.

4. The level of capital expenditure this local government has spent on the maintenance and repair of these systems during FY 1982.

5. The projected level of capital expenditure this local government expects to spend for maintenance of these basic infrastructure systems in FY 1987 and FY 2000. If these years do not coincide with this government's planning process please substitute your own periods in your response.

6. Please indicate the sources of the revenues utilized by this local government to meet these basic infrastructure needs using the following key: 1 = local taxes, 2 = general obligation bonds, 3 = revenue bonds, 4 = state grants, 5 = federal grants, 6 = user fees, 7 = other (please specify).

INFRASTRUCTURE CATEGORY	UNIT OF MEASURE	CAPITAL EXPENDITURE FOR NEW CONSTRUCTION, REPLACEMENT, UPGRADING			SOURCES OF REVENUE	EXPENDITURE FOR MAINTENANCE AND RECONSTRUCTION			SOURCES OF REVENUES
		FY 1982	FY 1987	FY 2000		FY 1982	FY 1987	FY 2000	
WATER DISTRIBUTION SYSTEMS									
WASTEWATER FACILITIES									
DRAINAGE SYSTEMS									

SECTION III

Additional Infrastructure Needs
(to be completed by the Chief Administrative Officer)

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1. Using a scale of 1 through 6 (1 being the highest priority and 6 being the lowest priority), please rank each of the following categories of infrastructure among all of your current basic infrastructure needs.

Bridges ____________
Highways ____________
Roads ____________
Streets ____________

Water Distribution Systems ________
Wastewater Facilities ____________
Drainage Systems ________________

2. A. Does this local government currently face additional extraordinary infrastructure needs that will compete for capital funds--such as new airport construction, new harbor or port facilities, public buildings, new park facilities, or solid waste disposal facilities to be provided now or in the future?

Yes____________ No____________

Category of infrastructure________________________

B. If yes, briefly describe the project including the level of capital expenditure required, the source(s) of revenue to be used and the greatest financial challenge associated with the project.

3. A. One area of major concern is the extent to which there are important barriers, other than the lack of funds, to the provision and maintenance of a locality's infrastructure needs. Would you please identify such problems facing your community.

B. Assuming that a more detailed research program will be necessary to develop improved ways of meeting the State's infrastructure needs, are there other areas of concern we have not mentioned that you would like to see addressed in a future study?

Thank you for your cooperation.